



SEQUENCE LISTING

<110> Bell, John C.
Sonenberg, Nahum
Stojdl, David F.
Brown, Earl G.
Atkins, Harold L.
Marius, Ricardo M.
Lichty, Brian D.
Knowles, Shane B.

<120> ONCOLYTIC VIRUS

<130> 18003-D1

<140> US 10/743,639

<141> 2003-12-22

<150> US 09/664,444

<151> 2000-09-18

<150> 60/287,590

<151> 1999-09-17

<160> 52

<170> PatentIn Ver. 2.1

<210> 1

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<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic
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1

5

10

<210> 2

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<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic
peptide

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10

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<211> 11
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<213> Artificial Sequence

<220>
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peptide

<400> 3
Cys His Gly Leu His Ser Asn Met Arg His Cys
1 5 10

<210> 4
<211> 9
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<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic
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<210> 5
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<220>
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<210> 6
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<220>
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<210> 7
<211> 9

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 7
Cys Asp Asn Asn His His His His Cys
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<210> 8
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<212> PRT
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<223> Description of Artificial Sequence: Synthetic peptide

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<210> 9
<211> 1269
<212> DNA
<213> Vesicular stomatitis virus

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tacatcaata ctacaaaaag tttgtcagat ctaagaggat atgtctacca aggcctcaaa 180
tccggaaatg tatcaatcat acatgtcaac agctacttgt atggagcatt aaaggacatc 240
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gtatcggatg cttccagaac cagcgcagat gacaaatggg tgcctttgta tctacttggc 420
ttatacagag tgggcagaac acaaatgcct gaatacagaa aaaagctcat ggatgggctg 480
acaaatcaat gcaaaatgat caatgaacag tttgaacctc ttgtgccaga aggtcgtgac 540
atTTTTgatg tgtggggaaa tgacagtaat tacacaaaaa ttgtcgctgc agtggacatg 600
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<210> 10

<211> 1269
<212> DNA
<213> Vesicular stomatitis virus

<400> 10

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<210> 11
<211> 1269
<212> DNA
<213> Vesicular stomatitis virus

<400> 11

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tacatcaata ctacaaaaag tttgtcagat ctaagaggat atgtctacca aggcctcaaa 180
tccggaaatg tatcaatcat acatgtcaac agctacttgt atggagcatt gaaggacatc 240
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ttatacagag tgggcagaac acaaatgcct gaatacagaa aaagggtcat ggatgggctg 480
acaaatcaat gcaaaatgat caatgaacag tttgaacctc ttgtgccaga aggtcgtgac 540
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<210> 12
<211> 1269
<212> DNA
<213> Vesicular stomatitis virus

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tccggaaaatg tatcaatcat acatgtcaac agctacttgt atggagcatt gaaggacatc 240
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gtcatgtcac tgcaaggcct aagagagaag acaattggca agtatgctaa gtcagaattt 1260
gacaaatga 1269

<210> 13
<211> 1029
<212> DNA
<213> Vesicular stomatitis virus

<220>
<221> modified_base
<222> (1)..(1029)
<223> "n" represents a, t, c, g, other or unknown

<400> 13
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accggaggat tgacgactaa tgcaccgccca caaggcagag atgtggtcga atggctcgga 900
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<210> 14
<211> 422
<212> PRT
<213> Vesicular stomatitis virus

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Lys Leu Pro Ala Asn Glu Asp Pro Val Glu Tyr Pro Ala Asp Tyr Phe
      20           25           30

Arg Lys Ser Lys Glu Ile Pro Leu Tyr Ile Asn Thr Thr Lys Ser Leu
      35           40           45

Ser Asp Leu Arg Gly Tyr Val Tyr Gln Gly Leu Lys Ser Gly Asn Val
      50           55           60

Ser Ile Ile His Val Asn Ser Tyr Leu Tyr Gly Ala Leu Lys Asp Ile
      65           70           75           80

Arg Gly Lys Leu Asp Lys Asp Trp Ser Ser Phe Gly Ile Asn Ile Gly
      85           90           95

Lys Ala Gly Asp Thr Ile Gly Ile Phe Asp Leu Val Ser Leu Lys Ala
      100          105          110

Leu Asp Gly Val Leu Pro Asp Gly Val Ser Asp Ala Ser Arg Thr Ser
      115          120          125

Ala Asp Asp Lys Trp Leu Pro Leu Tyr Leu Leu Gly Leu Tyr Arg Val
      130          135          140

Gly Arg Thr Gln Met Pro Glu Tyr Arg Lys Lys Leu Met Asp Gly Leu
      145          150          155          160

Thr Asn Gln Cys Lys Met Ile Asn Glu Gln Phe Glu Pro Leu Val Pro
      165          170          175

Glu Gly Arg Asp Ile Phe Asp Val Trp Gly Asn Asp Ser Asn Tyr Thr
      180          185          190

Lys Ile Val Ala Ala Val Asp Met Phe Phe His Met Phe Lys Lys His
      195          200          205

Glu Cys Ala Ser Phe Arg Tyr Gly Thr Ile Val Ser Arg Phe Lys Asp
      210          215          220

Cys Ala Ala Leu Ala Thr Phe Gly His Leu Cys Lys Ile Thr Gly Met
      225          230          235          240

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Ser Thr Glu Asp Val Thr Thr Trp Ile Leu Asn Arg Glu Val Ala Asp
 245 250 255
 Glu Met Val Gln Met Met Leu Pro Gly Gln Glu Ile Asp Lys Ala Asp
 260 265 270
 Ser Tyr Met Pro Tyr Leu Ile Asp Phe Gly Leu Ser Ser Lys Ser Pro
 275 280 285
 Tyr Ser Ser Val Lys Asn Pro Ala Phe His Phe Trp Gly Gln Leu Thr
 290 295 300
 Ala Leu Leu Leu Arg Ser Thr Arg Ala Arg Asn Ala Arg Gln Pro Asp
 305 310 315 320
 Asp Ile Glu Tyr Thr Ser Leu Thr Thr Ala Gly Leu Leu Tyr Ala Tyr
 325 330 335
 Ala Val Gly Ser Ser Ala Asp Leu Ala Gln Gln Phe Cys Val Gly Asp
 340 345 350
 Asn Lys Tyr Thr Pro Asp Asp Ser Thr Gly Gly Leu Thr Thr Asn Ala
 355 360 365
 Pro Pro Gln Gly Arg Asp Val Val Glu Trp Leu Gly Trp Phe Glu Asp
 370 375 380
 Gln Asn Arg Lys Pro Thr Pro Asp Met Met Gln Tyr Ala Lys Arg Ala
 385 390 395 400
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 405 410 415
 Lys Ser Glu Phe Asp Lys
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<210> 15
 <211> 422
 <212> PRT
 <213> Vesicular stomatitis virus

<400> 15
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 Lys Leu Pro Ala Asn Glu Asp Pro Val Glu Tyr Pro Ala Asp Tyr Phe
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 35 40 45
 Ser Asp Leu Arg Gly Tyr Val Tyr Gln Gly Leu Lys Ser Gly Asn Val
 50 55 60
 Ser Ile Ile His Val Asn Ser Tyr Leu Tyr Gly Ala Leu Lys Asp Ile
 65 70 75 80

Arg	Gly	Lys	Leu	Asp	Lys	Asp	Trp	Ser	Ser	Phe	Gly	Ile	Asn	Ile	Gly	
				85					90					95		
Lys	Ala	Gly	Asp	Thr	Ile	Gly	Ile	Phe	Asp	Leu	Val	Ser	Leu	Lys	Ala	
			100					105					110			
Leu	Asp	Gly	Val	Leu	Pro	Asp	Gly	Val	Ser	Asp	Ala	Ser	Arg	Thr	Ser	
		115					120					125				
Ala	Asp	Asp	Lys	Trp	Leu	Pro	Leu	Tyr	Leu	Leu	Gly	Leu	Tyr	Arg	Val	
	130					135					140					
Gly	Arg	Thr	Gln	Met	Pro	Glu	Tyr	Arg	Lys	Arg	Leu	Met	Asp	Gly	Leu	
145					150					155					160	
Thr	Asn	Gln	Cys	Lys	Met	Ile	Asn	Glu	Gln	Phe	Glu	Pro	Leu	Val	Pro	
				165					170					175		
Glu	Gly	Arg	Asp	Ile	Phe	Asp	Val	Trp	Gly	Asn	Asp	Ser	Asn	Tyr	Thr	
			180					185					190			
Lys	Ile	Val	Ala	Ala	Val	Asp	Met	Phe	Phe	His	Met	Phe	Lys	Lys	His	
		195					200					205				
Glu	Cys	Ala	Ser	Phe	Arg	Tyr	Gly	Thr	Ile	Val	Ser	Arg	Phe	Lys	Asp	
	210					215					220					
Cys	Ala	Ala	Leu	Ala	Thr	Phe	Gly	His	Leu	Cys	Lys	Ile	Thr	Gly	Met	
225					230					235					240	
Ser	Thr	Glu	Asp	Val	Thr	Thr	Trp	Ile	Leu	Asn	Arg	Glu	Val	Ala	Asp	
				245					250					255		
Glu	Met	Val	Gln	Met	Met	Leu	Pro	Gly	Gln	Glu	Ile	Asp	Lys	Ala	Asp	
			260					265					270			
Ser	Tyr	Met	Pro	Tyr	Leu	Ile	Asp	Phe	Gly	Leu	Ser	Ser	Lys	Ser	Pro	
		275					280					285				
Tyr	Ser	Ser	Val	Lys	Asn	Pro	Ala	Phe	His	Phe	Trp	Gly	Gln	Leu	Thr	
	290					295					300					
Ala	Leu	Leu	Leu	Arg	Ser	Thr	Arg	Ala	Arg	Asn	Ala	Arg	Gln	Pro	Asp	
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Asp	Ile	Glu	Tyr	Thr	Ser	Leu	Thr	Thr	Ala	Gly	Leu	Leu	Tyr	Ala	Tyr	
				325					330					335		
Ala	Val	Gly	Ser	Ser	Ala	Asp	Leu	Ala	Gln	Gln	Phe	Cys	Val	Gly	Asp	
			340					345					350			
Ser	Lys	Tyr	Thr	Pro	Asp	Asp	Ser	Thr	Gly	Gly	Leu	Thr	Thr	Asn	Ala	
		355					360					365				
Pro	Pro	Gln	Gly	Arg	Asp	Val	Val	Glu	Trp	Leu	Gly	Trp	Phe	Glu	Asp	
	370					375					380					

Gln Asn Arg Lys Pro Thr Pro Asp Met Met Gln Tyr Ala Lys Arg Ala
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Val Met Ser Leu Gln Gly Leu Arg Glu Lys Thr Ile Gly Lys Tyr Ala
405 410 415

Lys Ser Glu Phe Asp Lys
420

<210> 16

<211> 422

<212> PRT

<213> Vesicular stomatitis virus

<400> 16

Met Ser Val Thr Val Lys Arg Ile Ile Asp Asn Thr Val Ile Val Pro
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35 40 45

Ser Asp Leu Arg Gly Tyr Val Tyr Gln Gly Leu Lys Ser Gly Asn Val
50 55 60

Ser Ile Ile His Val Asn Ser Tyr Leu Tyr Gly Ala Leu Lys Asp Ile
65 70 75 80

Arg Gly Lys Leu Asp Lys Asp Trp Ser Ser Phe Gly Ile Asn Ile Gly
85 90 95

Lys Ala Gly Asp Thr Ile Gly Ile Phe Asp Leu Val Ser Leu Lys Ala
100 105 110

Leu Asp Gly Val Leu Pro Asp Gly Val Ser Asp Ala Ser Arg Thr Ser
115 120 125

Ala Asp Asp Lys Trp Leu Pro Leu Tyr Leu Leu Gly Leu Tyr Arg Val
130 135 140

Gly Arg Thr Gln Met Pro Glu Tyr Arg Lys Arg Leu Met Asp Gly Leu
145 150 155 160

Thr Asn Gln Cys Lys Met Ile Asn Glu Gln Phe Glu Pro Leu Val Pro
165 170 175

Glu Gly Arg Asp Ile Phe Asp Val Trp Gly Asn Asp Ser Asn Tyr Thr
180 185 190

Lys Ile Val Ala Ala Val Asp Met Phe Phe His Met Phe Lys Lys His
195 200 205

Glu Cys Ala Ser Phe Arg Tyr Gly Thr Ile Val Ser Arg Phe Lys Asp

210	215	220
Cys Ala Ala Leu Ala Thr Phe Gly His Leu Cys Lys Ile Thr Gly Met		
225	230	235 240
Ser Thr Glu Asp Val Thr Thr Trp Ile Leu Asn Arg Glu Val Ala Asp		
	245	250 255
Glu Met Val Gln Met Met Leu Pro Gly Gln Glu Ile Asp Lys Ala Asp		
	260	265 270
Ser Tyr Met Pro Tyr Leu Ile Asp Phe Gly Leu Ser Ser Lys Ser Pro		
	275	280 285
Tyr Ser Ser Val Lys Asn Pro Ala Phe His Phe Trp Gly Gln Leu Thr		
	290	295 300
Ala Leu Leu Leu Arg Ser Thr Arg Ala Arg Asn Ala Arg Gln Pro Asp		
305	310	315 320
Asp Ile Glu Tyr Thr Ser Leu Thr Thr Ala Gly Leu Leu Tyr Ala Tyr		
	325	330 335
Ala Val Gly Ser Ser Ala Asp Leu Ala Gln Gln Phe Cys Val Gly Asp		
	340	345 350
Ser Lys Tyr Thr Pro Asp Asp Ser Thr Gly Gly Leu Thr Thr Asn Ala		
	355	360 365
Pro Pro Gln Gly Arg Asp Val Val Glu Trp Leu Gly Trp Phe Glu Asp		
	370	375 380
Gln Asn Arg Lys Pro Thr Pro Asp Met Met Gln Tyr Ala Lys Arg Ala		
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Lys Ser Glu Phe Asp Lys		
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<210> 17
 <211> 342
 <212> PRT
 <213> Vesicular stomatitis virus

<220>
 <221> MOD_RES
 <222> (1)..(342)
 <223> "Xaa" represents any, other or unknown amino acid

<400> 17
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Lys	Ala	Gly	Asp	Thr	Ile	Gly	Ile	Phe	Asp	Leu	Val	Ser	Leu	Lys	Ala
		35					40					45			
Leu	Asp	Gly	Val	Leu	Pro	Asp	Gly	Val	Ser	Asp	Ala	Ser	Arg	Thr	Ser
	50					55					60				
Ala	Asp	Asp	Lys	Trp	Leu	Pro	Leu	Tyr	Leu	Leu	Gly	Leu	Tyr	Arg	Val
65					70					75					80
Gly	Arg	Thr	Gln	Met	Pro	Glu	Tyr	Arg	Lys	Arg	Leu	Met	Asp	Gly	Leu
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Thr	Asn	Gln	Cys	Lys	Met	Ile	Asn	Glu	Gln	Phe	Glu	Pro	Leu	Val	Pro
			100					105					110		
Glu	Gly	Arg	Asp	Ile	Phe	Asp	Val	Trp	Gly	Asn	Asp	Ser	Asn	Tyr	Thr
		115					120					125			
Lys	Ile	Val	Ala	Ala	Val	Asp	Met	Phe	Phe	His	Met	Phe	Lys	Lys	His
	130					135					140				
Glu	Cys	Ala	Ser	Phe	Arg	Tyr	Gly	Thr	Ile	Val	Ser	Arg	Phe	Lys	Asp
145					150					155					160
Cys	Ala	Ala	Leu	Ala	Thr	Phe	Gly	His	Leu	Cys	Lys	Ile	Thr	Gly	Met
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Ser	Thr	Glu	Asp	Val	Thr	Thr	Trp	Ile	Leu	Asn	Arg	Glu	Val	Ala	Asp
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Glu	Met	Val	Gln	Met	Met	Leu	Pro	Gly	Gln	Glu	Ile	Asp	Lys	Ala	Asp
	195						200					205			
Ser	Tyr	Met	Pro	Tyr	Leu	Ile	Asp	Phe	Gly	Leu	Ser	Ser	Lys	Ser	Pro
	210					215					220				
Tyr	Ser	Ser	Val	Lys	Asn	Pro	Ala	Phe	His	Phe	Trp	Gly	Gln	Leu	Thr
225					230					235					240
Asp	Ile	Glu	Tyr	Thr	Ser	Xaa	Thr	Thr	Ala	Gly	Leu	Leu	Tyr	Ala	Tyr
				245					250					255	
Ala	Val	Gly	Ser	Ser	Ala	Asp	Leu	Ala	Xaa	Gln	Phe	Cys	Val	Gly	Asp
			260					265					270		
Ser	Lys	Tyr	Thr	Pro	Asp	Asp	Ser	Thr	Gly	Gly	Leu	Thr	Thr	Asn	Ala
		275					280					285			
Pro	Pro	Gln	Gly	Arg	Asp	Val	Val	Glu	Trp	Leu	Gly	Trp	Phe	Glu	Asp
	290					295					300				
Gln	Asn	Arg	Lys	Pro	Thr	Pro	Asp	Met	Met	Gln	Tyr	Ala	Lys	Arg	Ala
305					310					315					320
Val	Met	Ser	Leu	Gln	Gly	Leu	Arg	Glu	Lys	Thr	Ile	Gly	Lys	Tyr	Ala

Lys Ser Glu Phe Asp Lys
340

<210> 18

<211> 798

<212> DNA

<213> Vesicular stomatitis virus

<400> 18

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atggataatc tcacaaaagt tcgtgagtat ctcaagtcct attctcgtct ggatcaggcg 60
gtaggagaga tagatgagat cgaagcacia cgagctgaaa agtccaatta tgagttgttc 120
caagaggatg gagtggaaga gcatactaag ccctcttatt ttcaggcagc agatgattct 180
gacacagaat ctgaaccaga aattgaagac aatcaagggt tgtatgcaca ggatccagaa 240
gctgagcaag ttgaaggctt tatacagggg ccttttagatg actatgcaga tgaggaagtg 300
gatgttgtat ttacttcgga ctggaaacca cctgagcttg aatctgacga gcatggaaaag 360
accttacggt tgacatcgcc agagggttta agtggagagc agaaatccca gtggctttcg 420
acgattaaag cagtcgtgca aagtgcacaa tactggaaatc tggcagagtg cacatttgaa 480
gcatcgggag aaggggtcat tatgaaggag cgccagataa ctccggatgt atataagggtc 540
actccagtga tgaacacaca tccgtcccaa tcagaagcag tatcagatgt ttggtctctc 600
tcaaagacat ccatgacttt ccaaccaag aaagcaagtc ttcagcctct caccatatcc 660
ttggatgaat tgttctcatc tagaggagag ttcatctctg tcggaggtga cggacgaatg 720
tctcataaag aggccatcct gctcggctg agatacaaaa agttgtacaa tcaggcgaga 780
gtcaaatatt ctctgtag 798
```

<210> 19

<211> 798

<212> DNA

<213> Vesicular stomatitis virus

<400> 19

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atggataatc tcacaaaagt tcgtgagtat ctcaagtcct attctcgtct agatcaggcg 60
gtaggagaga tagatgagat cgaagcacia cgagctgaaa agtccaatta tgagttgttc 120
caagaggacg gagtggaaga gcatactagg ccctcttatt ttcaggcagc agatgattct 180
gacacagaat ctgaaccaga aattgaagac aatcaaggct tgtatgtacc agatccggaa 240
gctgagcaag ttgaaggctt tatacagggg ccttttagatg actatgcgga tgaggacgtg 300
gatgttgtat tcacttcgga ctggaaacag cctgagcttg aatccgacga gcatggaaaag 360
accttacggt tgacattgcc agagggttta agtggagagc agaaatccca gtggcttttg 420
acgattaaag cagtcgttca aagtgcacaa cactggaatc tggcagagtg cacatttgaa 480
gcatcgggag aaggggtcat cataaaaaag cgccagataa ctccggatgt atataagggtc 540
actccagtga tgaacacaca tccgtcccaa tcagaagccg tatcagatgt ttggtctctc 600
tcaaagacat ccatgacttt ccaaccaag aaagcaagtc ttcagcctct caccatatcc 660
ttggatgaat tgttctcatc tagaggagaa ttcatctctg tcggaggtaa cggacgaatg 720
tctcataaag aggccatcct gctcggctg aggtacaaaa agttgtacaa tcaggcgaga 780
gtcaaatatt ctctgtag 798
```

<210> 20

<211> 570

<212> DNA

<213> Vesicular stomatitis virus

<400> 20

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atggataatc tcacaaaagt tcgtgagtat ctcaagtcct attctcgtct agatcaggcg 60
```

gtaggagaga	tagatgagat	cgaagcacia	cgagctgaaa	agtccaatta	tgagttgttc	120
caagaggacg	gagtggaaga	gcatactagg	ccctcttatt	ttcaggcagc	agatgattct	180
gacacagaat	ctgaaccaga	aattgaagac	aatcaaggct	tgtatgtacc	agatccggaa	240
gctgagcaag	ttgaaggctt	tatacagggg	ccttttagatg	actatgcgga	tgaggacgtg	300
gatgttgtat	tcacttcgga	ctggaaacag	cctgagcttg	aatccgacga	gcatggaaaag	360
accttacggt	tgacattgcc	agaggggtta	agtggagagc	agaaatccca	gtggcttttg	420
acgattaaag	cagtcgttca	aagtgccaaa	cactggaatc	tggcagagtg	cacatttgaa	480
gcatcgggag	aaggggtcat	cataaaaaag	cgccagataa	ctccggatgt	atataagggtc	540
actccagtga	tgaacacaca	tccgtcccaa				570

<210> 21

<211> 798

<212> DNA

<213> Vesicular stomatitis virus

<400> 21

atggataatc	tcacaaaagt	tcgtgagtat	ctcaagtcct	attctcgtct	agatcaggcg	60
gtaggagaga	tagatgagat	cgaagcacia	cgagctgaaa	agtccaatta	tgagttgttc	120
caagaggacg	gagtggaaga	gcatactagg	ccctcttatt	ttcaggcagc	agatgattct	180
gacacagaat	ctgaaccaga	aattgaagac	aatcaaggct	tgtatgtacc	agatccggaa	240
gctgagcaag	ttgaaggctt	tatacagggg	ccttttagatg	actatgcgga	tgaggacgtg	300
gatgttgtat	tcacttcgga	ctggaaacag	cctgagcttg	aatccgacga	gcatggaaaag	360
accttacggt	tgacattgcc	agaggggtta	agtggagagc	agaaatccca	gtggcttttg	420
acgattaaag	cagtcgttca	aagtgccaaa	cactggaatc	tggcagagtg	cacatttgaa	480
gcatcgggag	aaggggtcat	cataaaaaag	cgccagataa	ctccggatgt	atataagggtc	540
actccagtga	tgaacacaca	tccgtcccaa	tcggaagccg	tatcagatgt	ttggctctctc	600
tcaaagacat	ccatgacttt	ccaacccaag	aaagcaagtc	ttcagcctct	caccatatcc	660
ttggatgaat	tgttctcatc	tagaggagaa	ttcatctctg	tcggaggtaa	cggacgaatg	720
tctcataaag	aggccatcct	gctcgggtctg	aggtacaaaa	agttgtacaa	tcaggcgaga	780
gtcaaatatt	ctctgtag					798

<210> 22

<211> 798

<212> DNA

<213> Vesicular stomatitis virus

<400> 22

atggataatc	tcacaaaagt	tcgtgagtat	ctcaagtcct	attctcgtct	agatcaggcg	60
gtaggagaga	tagatgagat	cgaagcacia	cgagctgaaa	agtccaatta	tgagttgttc	120
caagaggacg	gagtggaaga	gcatactagg	ccctcttatt	ttcaggcagc	agatgattct	180
gacacagaat	ctgaaccaga	aattgaagac	aatcaaggct	tgtatgtacc	agatccggaa	240
gctgagcaag	ttgaaggctt	tatacagggg	ccttttagatg	actatgcgga	tgaggacgtg	300
gatgttgtat	tcacttcgga	ctggaaacag	cctgagcttg	aatccgacga	gcatggaaaag	360
accttacggt	tgacattgcc	agaggggtta	agtggagagc	agaaatccca	gtggcttttg	420
acgattaaag	cagtcgttca	aagtgccaaa	cactggaatc	tggcagagtg	cacatttgaa	480
gcatcgggag	aaggggtcat	cataaaaaag	cgccagataa	ctccggatgt	atataagggtc	540
actccagtga	tgaacacaca	tccgtcccaa	tcagaagccg	tatcagatgt	ttggctctctc	600
tcaaagacat	ccatgacttt	ccaacccaag	aaagcaagtc	ttcagcctct	caccatatcc	660
ttggatgaat	tgttctcatc	tagaggagaa	ttcatctctg	tcggaggtaa	cggacgaatg	720
tctcataaag	aggccatcct	gctcgggtctg	aggtacaaaa	agttgtacaa	tcaggcgaga	780
gtcaaatatt	ctctgtag					798

<210> 23

<211> 265

<212> PRT

<213> Vesicular stomatitis virus

<400> 23

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Met Asp Asn Leu Thr Lys Val Arg Glu Tyr Leu Lys Ser Tyr Ser Arg
 1              5              10              15

Leu Asp Gln Ala Val Gly Glu Ile Asp Glu Ile Glu Ala Gln Arg Ala
      20              25              30

Glu Lys Ser Asn Tyr Glu Leu Phe Gln Glu Asp Gly Val Glu Glu His
      35              40              45

Thr Lys Pro Ser Tyr Phe Gln Ala Ala Asp Asp Ser Asp Thr Glu Ser
      50              55              60

Glu Pro Glu Ile Glu Asp Asn Gln Gly Leu Tyr Ala Gln Asp Pro Glu
      65              70              75              80

Ala Glu Gln Val Glu Gly Phe Ile Gln Gly Pro Leu Asp Asp Tyr Ala
      85              90              95

Asp Glu Glu Val Asp Val Val Phe Thr Ser Asp Trp Lys Pro Pro Glu
      100              105              110

Leu Glu Ser Asp Glu His Gly Lys Thr Leu Arg Leu Thr Ser Pro Glu
      115              120              125

Gly Leu Ser Gly Glu Gln Lys Ser Gln Trp Leu Ser Thr Ile Lys Ala
      130              135              140

Val Val Gln Ser Ala Lys Tyr Trp Asn Leu Ala Glu Cys Thr Phe Glu
      145              150              155              160

Ala Ser Gly Glu Gly Val Ile Met Lys Glu Arg Gln Ile Thr Pro Asp
      165              170              175

Val Tyr Lys Val Thr Pro Val Met Asn Thr His Pro Ser Gln Ser Glu
      180              185              190

Ala Val Ser Asp Val Trp Ser Leu Ser Lys Thr Ser Met Thr Phe Gln
      195              200              205

Pro Lys Lys Ala Ser Leu Gln Pro Leu Thr Ile Ser Leu Asp Glu Leu
      210              215              220

Phe Ser Ser Arg Gly Glu Phe Ile Ser Val Gly Gly Asp Gly Arg Met
      225              230              235              240

Ser His Lys Glu Ala Ile Leu Leu Gly Leu Arg Tyr Lys Lys Leu Tyr
      245              250              255

Asn Gln Ala Arg Val Lys Tyr Ser Leu
      260              265
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<210> 24

<211> 265

<212> PRT

<213> Vesicular stomatitis virus

<400> 24

Met	Asp	Asn	Leu	Thr	Lys	Val	Arg	Glu	Tyr	Leu	Lys	Ser	Tyr	Ser	Arg
1				5					10					15	
Leu	Asp	Gln	Ala	Val	Gly	Glu	Ile	Asp	Glu	Ile	Glu	Ala	Gln	Arg	Ala
			20					25					30		
Glu	Lys	Ser	Asn	Tyr	Glu	Leu	Phe	Gln	Glu	Asp	Gly	Val	Glu	Glu	His
		35					40					45			
Thr	Arg	Pro	Ser	Tyr	Phe	Gln	Ala	Ala	Asp	Asp	Ser	Asp	Thr	Glu	Ser
	50					55					60				
Glu	Pro	Glu	Ile	Glu	Asp	Asn	Gln	Gly	Leu	Tyr	Val	Pro	Asp	Pro	Glu
65					70					75					80
Ala	Glu	Gln	Val	Glu	Gly	Phe	Ile	Gln	Gly	Pro	Leu	Asp	Asp	Tyr	Ala
				85					90					95	
Asp	Glu	Asp	Val	Asp	Val	Val	Phe	Thr	Ser	Asp	Trp	Lys	Gln	Pro	Glu
			100					105					110		
Leu	Glu	Ser	Asp	Glu	His	Gly	Lys	Thr	Leu	Arg	Leu	Thr	Leu	Pro	Glu
		115					120					125			
Gly	Leu	Ser	Gly	Glu	Gln	Lys	Ser	Gln	Trp	Leu	Leu	Thr	Ile	Lys	Ala
	130					135					140				
Val	Val	Gln	Ser	Ala	Lys	His	Trp	Asn	Leu	Ala	Glu	Cys	Thr	Phe	Glu
145					150					155					160
Ala	Ser	Gly	Glu	Gly	Val	Ile	Ile	Lys	Lys	Arg	Gln	Ile	Thr	Pro	Asp
				165					170					175	
Val	Tyr	Lys	Val	Thr	Pro	Val	Met	Asn	Thr	His	Pro	Ser	Gln	Ser	Glu
			180					185					190		
Ala	Val	Ser	Asp	Val	Trp	Ser	Leu	Ser	Lys	Thr	Ser	Met	Thr	Phe	Gln
		195					200					205			
Pro	Lys	Lys	Ala	Ser	Leu	Gln	Pro	Leu	Thr	Ile	Ser	Leu	Asp	Glu	Leu
		210				215					220				
Phe	Ser	Ser	Arg	Gly	Glu	Phe	Ile	Ser	Val	Gly	Gly	Asn	Gly	Arg	Met
225					230					235					240
Ser	His	Lys	Glu	Ala	Ile	Leu	Leu	Gly	Leu	Arg	Tyr	Lys	Lys	Leu	Tyr
				245					250					255	
Asn	Gln	Ala	Arg	Val	Lys	Tyr	Ser	Leu							
			260					265							

<210> 25
 <211> 190
 <212> PRT
 <213> Vesicular stomatitis virus

<400> 25
 Met Asp Asn Leu Thr Lys Val Arg Glu Tyr Leu Lys Ser Tyr Ser Arg
 1 5 10 15
 Leu Asp Gln Ala Val Gly Glu Ile Asp Glu Ile Glu Ala Gln Arg Ala
 20 25 30
 Glu Lys Ser Asn Tyr Glu Leu Phe Gln Glu Asp Gly Val Glu Glu His
 35 40 45
 Thr Arg Pro Ser Tyr Phe Gln Ala Ala Asp Asp Ser Asp Thr Glu Ser
 50 55 60
 Glu Pro Glu Ile Glu Asp Asn Gln Gly Leu Tyr Val Pro Asp Pro Glu
 65 70 75 80
 Ala Glu Gln Val Glu Gly Phe Ile Gln Gly Pro Leu Asp Asp Tyr Ala
 85 90 95
 Asp Glu Asp Val Asp Val Val Phe Thr Ser Asp Trp Lys Gln Pro Glu
 100 105 110
 Leu Glu Ser Asp Glu His Gly Lys Thr Leu Arg Leu Thr Leu Pro Glu
 115 120 125
 Gly Leu Ser Gly Glu Gln Lys Ser Gln Trp Leu Leu Thr Ile Lys Ala
 130 135 140
 Val Val Gln Ser Ala Lys His Trp Asn Leu Ala Glu Cys Thr Phe Glu
 145 150 155 160
 Ala Ser Gly Glu Gly Val Ile Ile Lys Lys Arg Gln Ile Thr Pro Asp
 165 170 175
 Val Tyr Lys Val Thr Pro Val Met Asn Thr His Pro Ser Gln
 180 185 190

<210> 26
 <211> 265
 <212> PRT
 <213> Vesicular stomatitis virus

<400> 26
 Met Asp Asn Leu Thr Lys Val Arg Glu Tyr Leu Lys Ser Tyr Ser Arg
 1 5 10 15
 Leu Asp Gln Ala Val Gly Glu Ile Asp Glu Ile Glu Ala Gln Arg Ala
 20 25 30
 Glu Lys Ser Asn Tyr Glu Leu Phe Gln Glu Asp Gly Val Glu Glu His
 35 40 45

Thr Arg Pro Ser Tyr Phe Gln Ala Ala Asp Asp Ser Asp Thr Glu Ser
 50 55 60
 Glu Pro Glu Ile Glu Asp Asn Gln Gly Leu Tyr Val Pro Asp Pro Glu
 65 70 75 80
 Ala Glu Gln Val Glu Gly Phe Ile Gln Gly Pro Leu Asp Asp Tyr Ala
 85 90 95
 Asp Glu Asp Val Asp Val Val Phe Thr Ser Asp Trp Lys Gln Pro Glu
 100 105 110
 Leu Glu Ser Asp Glu His Gly Lys Thr Leu Arg Leu Thr Leu Pro Glu
 115 120 125
 Gly Leu Ser Gly Glu Gln Lys Ser Gln Trp Leu Leu Thr Ile Lys Ala
 130 135 140
 Val Val Gln Ser Ala Lys His Trp Asn Leu Ala Glu Cys Thr Phe Glu
 145 150 155 160
 Ala Ser Gly Glu Gly Val Ile Ile Lys Lys Arg Gln Ile Thr Pro Asp
 165 170 175
 Val Tyr Lys Val Thr Pro Val Met Asn Thr His Pro Ser Gln Ser Glu
 180 185 190
 Ala Val Ser Asp Val Trp Ser Leu Ser Lys Thr Ser Met Thr Phe Gln
 195 200 205
 Pro Lys Lys Ala Ser Leu Gln Pro Leu Thr Ile Ser Leu Asp Glu Leu
 210 215 220
 Phe Ser Ser Arg Gly Glu Phe Ile Ser Val Gly Gly Asn Gly Arg Met
 225 230 235 240
 Ser His Lys Glu Ala Ile Leu Leu Gly Leu Arg Tyr Lys Lys Leu Tyr
 245 250 255
 Asn Gln Ala Arg Val Lys Tyr Ser Leu
 260 265

<210> 27

<211> 265

<212> PRT

<213> Vesicular stomatitis virus

<400> 27

Met Asp Asn Leu Thr Lys Val Arg Glu Tyr Leu Lys Ser Tyr Ser Arg
 1 5 10 15
 Leu Asp Gln Ala Val Gly Glu Ile Asp Glu Ile Glu Ala Gln Arg Ala
 20 25 30
 Glu Lys Ser Asn Tyr Glu Leu Phe Gln Glu Asp Gly Val Glu Glu His

35

40

45

Thr Arg Pro Ser Tyr Phe Gln Ala Ala Asp Asp Ser Asp Thr Glu Ser
50 55 60

Glu Pro Glu Ile Glu Asp Asn Gln Gly Leu Tyr Val Pro Asp Pro Glu
65 70 75 80

Ala Glu Gln Val Glu Gly Phe Ile Gln Gly Pro Leu Asp Asp Tyr Ala
85 90 95

Asp Glu Asp Val Asp Val Val Phe Thr Ser Asp Trp Lys Gln Pro Glu
100 105 110

Leu Glu Ser Asp Glu His Gly Lys Thr Leu Arg Leu Thr Leu Pro Glu
115 120 125

Gly Leu Ser Gly Glu Gln Lys Ser Gln Trp Leu Leu Thr Ile Lys Ala
130 135 140

Val Val Gln Ser Ala Lys His Trp Asn Leu Ala Glu Cys Thr Phe Glu
145 150 155 160

Ala Ser Gly Glu Gly Val Ile Ile Lys Lys Arg Gln Ile Thr Pro Asp
165 170 175

Val Tyr Lys Val Thr Pro Val Met Asn Thr His Pro Ser Gln Ser Glu
180 185 190

Ala Val Ser Asp Val Trp Ser Leu Ser Lys Thr Ser Met Thr Phe Gln
195 200 205

Pro Lys Lys Ala Ser Leu Gln Pro Leu Thr Ile Ser Leu Asp Glu Leu
210 215 220

Phe Ser Ser Arg Gly Glu Phe Ile Ser Val Gly Gly Asn Gly Arg Met
225 230 235 240

Ser His Lys Glu Ala Ile Leu Leu Gly Leu Arg Tyr Lys Lys Leu Tyr
245 250 255

Asn Gln Ala Arg Val Lys Tyr Ser Leu
260 265

<210> 28

<211> 690

<212> DNA

<213> Vesicular stomatitis virus

<400> 28

atgagttcct taaagaagat tctcgggtctg aaggggaaaag gtaagaaatc taagaaatta 60
gggatcgac cacccttga tgaagaggac actagcatgg agtatgctcc gagcgctcca 120
attgacaaat cctatttttg agttgacgag atggacacct atgatccgaa tcaattaaga 180
tatgagaaat tcttctttac agtgaaaatg acgggttagat ctaatcgtcc gttcagaaca 240
tactcagatg tggcagccgc tgtatcccat tgggatcaca tgtacatcgg aatggcaggg 300
aaacgtccct tctacaaaat cttgggtttt ttgggttctt ctaatctaaa ggccactcca 360

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gcggtatttg cagatcaagg tcaaccagag tatcacactc actgcgaagg cagggcttat 420
ttgccacata ggaatggggaa gacccctccc atgctcaatg taccagagca cttcagaaga 480
ccattcaata taggtcttta caagggaaacg attgagctca caatgacat ctacgatgat 540
gagtcactgg aagcagctcc tatgatctgg gatcatttca attcttccaa attttctgat 600
ttcagagaga aggccttaat gtttggcctg attgtcgaga aaaaggcatc tggagcgtgg 660
gtcctggatt ctatcagcca cttcaaatga 690

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<210> 29

<211> 690

<212> DNA

<213> Vesicular stomatitis virus

<400> 29

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atgagttcct taaagaagat tctcgggtctg aaggggaaaag gtaagaaatc taagaaatta 60
gggatcgcac cacccttcta tgaagaggac actaacatgg agtatgctcc gagcgctcca 120
attgacaaat cctatttttg agttgacgag atggacactc atgatccgca tcaattaaga 180
tatgagaaat tcttctttac agtgaaaatg acgggttagat ctaatcgtcc gttcagaaca 240
tactcagatg tggcagccgc tgtatcccat tgggatcaca tgtacatcgg aatggcaggg 300
aaacgtccct tctacaagat cttgggtttt ttgggttctt ctaatctaaa ggccactcca 360
gcggtatttg cagatcaagg tcaaccagag tatcacgctc actgtgaagg cagggcttat 420
ttgccacaca gaatggggaa gacccctccc atgctcaatg taccagagca cttcagaaga 480
ccattcaata taggtcttta caagggaaacg gttgagctca caatgacat ctacgatgat 540
gagtcactgg aagcagctcc tatgatctgg gatcatttca attcttccaa attttctgat 600
ttcagagaga aggccttaat gtttggcctg attgtcgaga aaaaggcatc tggagcgtgg 660
gtcctggatt ctgtcagcca cttcaaatga 690

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<210> 30

<211> 690

<212> DNA

<213> Vesicular stomatitis virus

<400> 30

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atgagttcct taaagaagat tctcgggtctg aaggggaaaag gtaagaaatc taagaaatta 60
gggatcgcac cacccttcta tgaagaggac actaacatgg agtatgctcc gagcgctcca 120
attgacaaat cctatttttg agttgacgag agggacactc atgatccgca tcaattaaga 180
tatgagaaat tcttctttac agtgaaaatg acgggttagat ctaatcgtcc gttcagaaca 240
tactcagatg tggcagccgc tgtatcccat tgggatcaca tgtacatcgg aatggcaggg 300
aaacgtccct tctacaagat cttgggtttt ttgggttctt ctaatctaaa ggccactcca 360
gcggtatttg cagatcaagg tcaaccagag tatcacgctc actgtgaagg cagggcttat 420
ttgccacaca gaatggggaa gacccctccc atgctcaatg taccagagca cttcagaaga 480
ccattcaata taggtcttta caagggaaacg gttgagctca caatgacat ctacgatgat 540
gagtcactgg aagcagctcc tatgatctgg gatcatttca attcttccaa attttctgat 600
ttcagagaga aggccttaat gtttggcctg attgtcgaga aaaaggcatc tggagcgtgg 660
gtcctggatt ctgtcagcca cttcaaatga 690

```

<210> 31

<211> 690

<212> DNA

<213> Vesicular stomatitis virus

<400> 31

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atgagttcct taaagaagat tctcgggtctg aaggggaaaag gtaagaaatc taagaaatta 60
gggatcgcac cacccttcta tgaagaggac actaacatgg agtatgctcc gagcgctcca 120
attgacaaat cctatttttg agttgacgag atggacactc atgatccgca tcaattaaga 180

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tatgagaaat tcttctttac agtgaaaatg acgggttagat ctaatcgtcc gttcagaaca 240
tactcagatg tggcagccgc tgtatcccat tgggatcaca tgtacatcgg aatggcaggg 300
aaacgtccct tctacaagat cttgggctttt ttgggttctt ctaatctaaa ggccactcca 360
gcggtattgg cagatcaagg tcaaccagag tatcacgctc actgtgaagg cagggcttat 420
ttgccacaca gaatggggaa gacccctccc atgctcaatg taccagagca cttcagaaga 480
ccattcaata taggtcttta caagggaaacg gttgagctca caatgaccat ctacgatgat 540
gagtcactgg aagcagctcc tatgatctgg gatcatttca attcttccaa attttctgat 600
ttcagagaga aggccttaat gtttggcctg attgtcgaga aaaaggcatc tggagcttgg 660
gtcctggatt ctgctagcca cttcaaatga 690

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<210> 32

<211> 229

<212> PRT

<213> Vesicular stomatitis virus

<400> 32

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Met Ser Ser Leu Lys Lys Ile Leu Gly Leu Lys Gly Lys Gly Lys Lys
  1                      5                      10                      15

Ser Lys Lys Leu Gly Ile Ala Pro Pro Pro Tyr Glu Glu Asp Thr Ser
      20                      25                      30

Met Glu Tyr Ala Pro Ser Ala Pro Ile Asp Lys Ser Tyr Phe Gly Val
      35                      40                      45

Asp Glu Met Asp Thr Tyr Asp Pro Asn Gln Leu Arg Tyr Glu Lys Phe
      50                      55                      60

Phe Phe Thr Val Lys Met Thr Val Arg Ser Asn Arg Pro Phe Arg Thr
      65                      70                      75                      80

Tyr Ser Asp Val Ala Ala Ala Val Ser His Trp Asp His Met Tyr Ile
      85                      90                      95

Gly Met Ala Gly Lys Arg Pro Phe Tyr Lys Ile Leu Ala Phe Leu Gly
      100                      105                      110

Ser Ser Asn Leu Lys Ala Thr Pro Ala Val Leu Ala Asp Gln Gly Gln
      115                      120                      125

Pro Glu Tyr His Thr His Cys Glu Gly Arg Ala Tyr Leu Pro His Arg
      130                      135                      140

Met Gly Lys Thr Pro Pro Met Leu Asn Val Pro Glu His Phe Arg Arg
      145                      150                      155                      160

Pro Phe Asn Ile Gly Leu Tyr Lys Gly Thr Ile Glu Leu Thr Met Thr
      165                      170                      175

Ile Tyr Asp Asp Glu Ser Leu Glu Ala Ala Pro Met Ile Trp Asp His
      180                      185                      190

Phe Asn Ser Ser Lys Phe Ser Asp Phe Arg Glu Lys Ala Leu Met Phe
      195                      200                      205

Gly Leu Ile Val Glu Lys Lys Ala Ser Gly Ala Trp Val Leu Asp Ser

```

210

215

220

Ile Ser His Phe Lys
225

<210> 33

<211> 229

<212> PRT

<213> Vesicular stomatitis virus

<400> 33

Met Ser Ser Leu Lys Lys Ile Leu Gly Leu Lys Gly Lys Gly Lys Lys
1 5 10 15

Ser Lys Lys Leu Gly Ile Ala Pro Pro Pro Tyr Glu Glu Asp Thr Asn
20 25 30

Met Glu Tyr Ala Pro Ser Ala Pro Ile Asp Lys Ser Tyr Phe Gly Val
35 40 45

Asp Glu Met Asp Thr His Asp Pro His Gln Leu Arg Tyr Glu Lys Phe
50 55 60

Phe Phe Thr Val Lys Met Thr Val Arg Ser Asn Arg Pro Phe Arg Thr
65 70 75 80

Tyr Ser Asp Val Ala Ala Ala Val Ser His Trp Asp His Met Tyr Ile
85 90 95

Gly Met Ala Gly Lys Arg Pro Phe Tyr Lys Ile Leu Ala Phe Leu Gly
100 105 110

Ser Ser Asn Leu Lys Ala Thr Pro Ala Val Leu Ala Asp Gln Gly Gln
115 120 125

Pro Glu Tyr His Ala His Cys Glu Gly Arg Ala Tyr Leu Pro His Arg
130 135 140

Met Gly Lys Thr Pro Pro Met Leu Asn Val Pro Glu His Phe Arg Arg
145 150 155 160

Pro Phe Asn Ile Gly Leu Tyr Lys Gly Thr Val Glu Leu Thr Met Thr
165 170 175

Ile Tyr Asp Asp Glu Ser Leu Glu Ala Ala Pro Met Ile Trp Asp His
180 185 190

Phe Asn Ser Ser Lys Phe Ser Asp Phe Arg Glu Lys Ala Leu Met Phe
195 200 205

Gly Leu Ile Val Glu Lys Lys Ala Ser Gly Ala Trp Val Leu Asp Ser
210 215 220

Val Ser His Phe Lys
225

<210> 34
<211> 229
<212> PRT
<213> Vesicular stomatitis virus

<400> 34
Met Ser Ser Leu Lys Lys Ile Leu Gly Leu Lys Gly Lys Gly Lys Lys
1 5 10 15
Ser Lys Lys Leu Gly Ile Ala Pro Pro Pro Tyr Glu Glu Asp Thr Asn
20 25 30
Met Glu Tyr Ala Pro Ser Ala Pro Ile Asp Lys Ser Tyr Phe Gly Val
35 40 45
Asp Glu Met Asp Thr His Asp Pro His Gln Leu Arg Tyr Glu Lys Phe
50 55 60
Phe Phe Thr Val Lys Met Thr Val Arg Ser Asn Arg Pro Phe Arg Thr
65 70 75 80
Tyr Ser Asp Val Ala Ala Ala Val Ser His Trp Asp His Met Tyr Ile
85 90 95
Gly Met Ala Gly Lys Arg Pro Phe Tyr Lys Ile Leu Ala Phe Leu Gly
100 105 110
Ser Ser Asn Leu Lys Ala Thr Pro Ala Val Leu Ala Asp Gln Gly Gln
115 120 125
Pro Glu Tyr His Ala His Cys Glu Gly Arg Ala Tyr Leu Pro His Arg
130 135 140
Met Gly Lys Thr Pro Pro Met Leu Asn Val Pro Glu His Phe Arg Arg
145 150 155 160
Pro Phe Asn Ile Gly Leu Tyr Lys Gly Thr Val Glu Leu Thr Met Thr
165 170 175
Ile Tyr Asp Asp Glu Ser Leu Glu Ala Ala Pro Met Ile Trp Asp His
180 185 190
Phe Asn Ser Ser Lys Phe Ser Asp Phe Arg Glu Lys Ala Leu Met Phe
195 200 205
Gly Leu Ile Val Glu Lys Lys Ala Ser Gly Ala Trp Val Leu Asp Ser
210 215 220
Val Ser His Phe Lys
225

<210> 35
<211> 229
<212> PRT
<213> Vesicular stomatitis virus

<400> 35

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Met Ser Ser Leu Lys Lys Ile Leu Gly Leu Lys Gly Lys Gly Lys Lys
 1          5          10          15

Ser Lys Lys Leu Gly Ile Ala Pro Pro Pro Tyr Glu Glu Asp Thr Asn
          20          25          30

Met Glu Tyr Ala Pro Ser Ala Pro Ile Asp Lys Ser Tyr Phe Gly Val
          35          40          45

Asp Glu Arg Asp Thr His Asp Pro His Gln Leu Arg Tyr Glu Lys Phe
 50          55          60

Phe Phe Thr Val Lys Met Thr Val Arg Ser Asn Arg Pro Phe Arg Thr
 65          70          75          80

Tyr Ser Asp Val Ala Ala Ala Val Ser His Trp Asp His Met Tyr Ile
          85          90          95

Gly Met Ala Gly Lys Arg Pro Phe Tyr Lys Ile Leu Ala Phe Leu Gly
          100          105          110

Ser Ser Asn Leu Lys Ala Thr Pro Ala Val Leu Ala Asp Gln Gly Gln
          115          120          125

Pro Glu Tyr His Ala His Cys Glu Gly Arg Ala Tyr Leu Pro His Arg
          130          135          140

Met Gly Lys Thr Pro Pro Met Leu Asn Val Pro Glu His Phe Arg Arg
          145          150          155          160

Pro Phe Asn Ile Gly Leu Tyr Lys Gly Thr Val Glu Leu Thr Met Thr
          165          170          175

Ile Tyr Asp Asp Glu Ser Leu Glu Ala Ala Pro Met Ile Trp Asp His
          180          185          190

Phe Asn Ser Ser Lys Phe Ser Asp Phe Arg Glu Lys Ala Leu Met Phe
          195          200          205

Gly Leu Ile Val Glu Lys Lys Ala Ser Gly Ala Trp Val Leu Asp Ser
          210          215          220

Val Ser His Phe Lys
225
```

<210> 36

<211> 1536

<212> DNA

<213> Vesicular stomatitis virus

<400> 36

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atgaagtgcc ttttgtactt agccttttta ttcattgggg tgaattgcaa gttcaccata 60
gtttttccac acaaccaaaa aggaaactgg aaaaatgttc cttctaatta ccattattgc 120
ccgtcaagct cagatttaaa ttggcataat gacttaatag gcacagccat acaagtcaaa 180
```

```

atgcccaaga gtcacaaggc tattcaagca gacggttggg tgtgtcatgc ttccaaatgg 240
gtcactactt gtgatttccg ctggtatgga ccgaagtata taacacagtc catccgatcc 300
ttcactccat ctgtagaaca atgcaaggaa agcattgaac aaacgaaaca aggaacttgg 360
ctgaatccag gcttccctcc tcaaagttgt ggatatgcaa ctgtgacgga tgccgaagca 420
gtgattgtcc aggtgactcc tcacatgtg ctggttgatg aatacacagg agaatgggtt 480
gattcacagt tcatcaacgg aaaatgcagc aattacatat gcccactgt ccataactct 540
acaacctggc attctgacta taagggtcaaa gggctatgtg attctaacct catttccatg 600
gacatcacct tcttctcaga ggacggagag ctatcatccc tgggaaagga gggcacaggg 660
ttcagaagta actactttgc ttatgaaact ggaggcaagg cctgcaaaat gcaatactgc 720
aagcattggg gagtcagact cccatcaggt gtctggttcg agatggctga taaggatctc 780
tttgctgcag ccagattccc tgaatgccc gaagggtcaa gtatctctgc tccatctcag 840
acctcagtgg atgtaagtct aattcaggac gttgagagga tcttgatta ttccctctgc 900
caagaaacct ggagcaaaat cagagcgggt cttccaatct ctccagtga tctcagctat 960
cttgctccta aaaacccagg aaccggtcct gctttcacca taatcaatgg taccctaaaa 1020
tactttgaga ccagatacat cagagtcgat attgctgctc caatcctctc aagaatgggtc 1080
ggaatgatca gtggaactac cacagaaagg gaactgtggg atgactgggc accatatgaa 1140
gacgtggaaa ttggacccaa tggagtctg aggaccagtt caggatataa gtttccttta 1200
tacatgattg gacatggtat gttggactcc gatcttcac ttagctcaaa ggctcaggtg 1260
ttcgaacatc ctcacattca agacgctgct tcgcaacttc ctgatgatga gagtttattt 1320
tttggtgata ctgggctatc caaaaatcca atcgagcttg tagaagggtg gttcagtagt 1380
tggaagagct ctattgcctc ttttttctt atcatagggg taatcattgg actattcttg 1440
gttctccgag ttggtatcca tctttgcatt aaattaaagc acaccaagaa aagacagatt 1500
tatacacaca tagagatgaa ccgacttggg aagtaa 1536

```

<210> 37

<211> 885

<212> DNA

<213> Vesicular stomatitis virus

<220>

<221> modified_base

<222> (1)..(885)

<223> "n" represents a, t, c, g, other or unknown

<400> 37

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atgaagtgcc ttttgkactt agctttttta ttcacggttg tgaattgcaa gttcaccata 60
gtttttccat acaaccacaaa aggaacttgg aaaaatgttc cttccaatta ccattattgc 120
ccgtcaagct cagatttataa ttgncataat gacttaatag gcacagcctt acaagtcaaa 180
atgcccaaga gtcacaaggc tattcaagca gacggttggg tgtgtcatgc ttccaaatgg 240
gtcactactt gtgatttccg ctggtacgga ccgaagtata taacacattc catccgatcc 300
ttcactccat ctgtagaaca atgcaaggaa agcattgaac aaacgaaaca aggaacttgg 360
ctgaatccag gcttccctcc tcaaagttgt ggatatgcaa ctgtgacgga tgctgaagca 420
gcgattgtcc aggtgactcc tcacatgtg cttgttgatg aatacacagg agaatgggtt 480
gattcacagt tcatcaacgg aaaatgcagc aatgacatat gcccactgt ccataactcc 540
acaacctggc attccgacta taagggtcaaa gggctatgtg attctaacct catttccatg 600
gacatcacct tcttctcaga ggacggagag ctatcatccc taggaaagga gggcacaggg 660
ttcagaagta actactttgc ttatgaaact ggagacaagg cctgcaaaat gcagtactgc 720
aagcgttggg gagtcagact cccatcaggt gtctggttcg agatggctga taaggatctc 780
tttgctgcag ccagattccc tgaatgccc gaagggtcaa gtatctctgc tccatctcag 840
acctcagtgg atgtaagtct cattcaggac gttgagagga tcttg 885

```

<210> 38

<211> 705

<212> DNA

<213> Vesicular stomatitis virus

<400> 38

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cctctcaga cctcagtggg tgtaagtctc attcaggacg ttgagaggat cttggattat 60
tccctctgcc aagaaacctg gagcaaaatc agagcgggtc ttcccatctc tccagtggat 120
ctcagctatc ttgctcctaa aaaccaggga accggtcctg tctttaccat aatcaatggg 180
accctaaaat actttgagac cagatacatc agagtgcata ttgctgctcc aatcctctca 240
agaatggtcg gaatgatcag tggaaactacc acagaaaggg aactgtggga tgactgggct 300
ccatatgaag acgtggaaat tggacccaat ggagttctga ggaccagttc aggatataag 360
tttcctttat atatgattgg acatgggatg ttggactccg atcttcatct tagctcaaa 420
gtcagggtgt ttgaacatcc tcacattcaa gacgtgctt cgcagcttcc tgatgatgag 480
actttatttt ttggtgatac tgggctatcc aaaaatccaa tcgagtttgt agaaggttgg 540
ttcagtagtt ggaagagctc tattgcctct tttttcttta tcatagggtt aatcatttga 600
ctattcttgg ttctccgagt tggattttat ctttgcatta aattaaagca caccaagaaa 660
agacagattt atacagacat agagatgaac cgacttggga agtaa 705
```

<210> 39

<211> 1536

<212> DNA

<213> Vesicular stomatitis virus

<400> 39

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atgaagtgcc ttttgtactt agcttttttta ttcacgggg tgaattgcaa gttcaccata 60
gtttttccat acaaccgaaa aggaaactgg aaaaatgttc cttccaatta ccattattgc 120
ccgtcaagct cagattttaa ttggcataat gacttaatag gcacagcctt acaagtcaaa 180
atgcccaaga gtcacaaggc tattcaagca gacggttggg tgtgtcatgc ttccaaatgg 240
gtcactactt gtgatttccg ctggtacgga ccgaagtata taacacattc catccgatcc 300
ttcactccat ctgtagaaca atgcaaggaa agcattgaac aaacgaaaca aggaacttgg 360
ctgaatccag gcttccctcc tcaaagtgtg ggaatgcaa ctgtgacgga tgctgaagca 420
gcgattgtcc aggtgactcc tcaccatgtg cttgttgatg aatacacagg agaatgggtt 480
gattcacagt tcatcaacgg aaaatgcagc aatgacatat gccccactgt ccataactcc 540
acaacctggc attccgacta taagggtcaa gggctatgtg attctaacct catttccatg 600
gacatcacct tcttctcaga ggacggagag ctatcatccc taggaaagga gggcacaggg 660
ttcagaagta actactttgc ttatgaaact ggagacaagg cctgcaaaat gcagtactgc 720
aagcattggg gagtcagact cccatcagg gtctggttcg agatggctga taaggatctc 780
tttgctgcag ccagattccc tgaatgccc gaagggtcaa gtatctctgc tccatctcag 840
acctcagtgg atgtaagtct cattcaggac gttgagagga tcttggatta ttccctctgc 900
caagaaacct ggagcaaaat cagagcgggt cttcccatct ctccagtgga tctcagctat 960
cttgctccta aaaaccagg aaccggtcct gctttcacca taatcaatgg taccctaaaa 1020
tactttgaga ccagatacat cagagtgcgt attgctgctc caatcctctc aagaatgggtc 1080
ggaatgatca gtggaactac cacagaaagg gaactgtggg atgactgggc tccatatgaa 1140
gacgtggaaa ttggacccaa tggagttctg aggaccagtt caggatataa gtttccttta 1200
tatatgattg gacatggtat gttggactcc gatcttcac ttagctcaaa ggctcagggtg 1260
tttgaacatc ctcacattca agacgtgght gcgcagcttc ctgatgatga gactttattt 1320
tttgggtgata ctgggctatc caaaaatcca atcgagtttg tagaagggtt gttcagtagt 1380
tggaagagct ctattgcctc ttttttcttt atcatagggt taatcattgg actattcttg 1440
gttctccgag ttggtattta tctttgcatt aaattaaagc acaccaagaa aagacagatt 1500
tatacagaca tagagatgaa ccgacttggg aagtaa 1536
```

<210> 40

<211> 1399

<212> DNA

<213> Vesicular stomatitis virus

<400> 40

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atgaagtgcc ttttgtactt agcttttttta ttcacgggg tgaattgcaa gttcaccata 60
```

```

gtttttccat acaaccaaaa aggaaactgg aaaaatgttc cttccaatta ccattattgc 120
ccgtcaagct cagattttaa ttggcataat gacttaatag gcacagcctt acagggtcaaa 180
atgcccaaga gtcacaaggc tattcaagca gacggttgga tgtgtcatgc ttccaaatgg 240
gtcactactt gtgattttccg ctggtacgga ccgaagtata taacacattc catccgatcc 300
ttcactccat ctgtagaaca atgcaaggaa agcattgaac aaacgaaaaca aggaacttgg 360
ctgaatccag gcttccctcc tcaaagttgt ggatatgcaa ctgtgacgga tgctgaagca 420
gcgattgtcc aggtgactcc tcaccatgtg cttgttgatg aatacacagg agaatgggtt 480
gattcacagt tcatcaacgg aaaatgcagc aatgacatat gccccactgt ccataactcc 540
acaacctggc attccgacta taagggtcaaa gggctatgtg attctaacct catttccatg 600
gacatcacct tcttctcaga ggacggagag ctatcatccc taggaaagga gggcacaggg 660
ttcagaagta actactttgc ttatgaaact ggagacaagg cctgcaaaat gcagtactgc 720
aagcgttggg gagtcagact cccatcaggt gtctggttcg ggatggctga taaggatctc 780
tttgctgcag ccagattccc tgaatgcccc gaagggtcaa gtatctctgc tccatctcag 840
acctcagtgg atgtaagtct cattcaggac gttgagagga tcttactttg agaccagata 900
catcagagtc gatatttgctg ctccaatcct ctcaagaatg gtcggaatga tcagtggaac 960
taccacagaa agggaaactgt gggatgactg ggctccatat gaagacgtgg aaattggacc 1020
caatggagtt ctgaggacca gttcaggata taagtttcct ttatatatga ttggacatgg 1080
tatgttggac tccgatcttc atcttagctc aaaggctcag gtgtttgaac atcctcacat 1140
tcaagacgct gcttcgcagc ttctgatga tgagacttta ttttttgggtg atactgggct 1200
atccaaaaat ccaatcgagt ttgtagaagg ttggttcagt agttggaaga gctctattgc 1260
ctcttttttc tttatcatag ggtaatcat tggactattc ttggttctcc gagttggtat 1320
ttatctttgc attaaattaa agcacaccaa gaaaagacag atttatacag acatagagat 1380
gaaccgactt gggaagtaa 1399

```

<210> 41

<211> 511

<212> PRT

<213> Vesicular stomatitis virus

<400> 41

```

Met Lys Cys Leu Leu Tyr Leu Ala Phe Leu Phe Ile Gly Val Asn Cys
  1               5               10              15

Lys Phe Thr Ile Val Phe Pro His Asn Gln Lys Gly Asn Trp Lys Asn
      20              25              30

Val Pro Ser Asn Tyr His Tyr Cys Pro Ser Ser Ser Asp Leu Asn Trp
      35              40              45

His Asn Asp Leu Ile Gly Thr Ala Ile Gln Val Lys Met Pro Lys Ser
      50              55              60

His Lys Ala Ile Gln Ala Asp Gly Trp Met Cys His Ala Ser Lys Trp
      65              70              75              80

Val Thr Thr Cys Asp Phe Arg Trp Tyr Gly Pro Lys Tyr Ile Thr Gln
      85              90              95

Ser Ile Arg Ser Phe Thr Pro Ser Val Glu Gln Cys Lys Glu Ser Ile
      100             105             110

Glu Gln Thr Lys Gln Gly Thr Trp Leu Asn Pro Gly Phe Pro Pro Gln
      115             120             125

Ser Cys Gly Tyr Ala Thr Val Thr Asp Ala Glu Ala Val Ile Val Gln
      130             135             140

```

Val	Thr	Pro	His	His	Val	Leu	Val	Asp	Glu	Tyr	Thr	Gly	Glu	Trp	Val	
145					150					155					160	
Asp	Ser	Gln	Phe	Ile	Asn	Gly	Lys	Cys	Ser	Asn	Tyr	Ile	Cys	Pro	Thr	
				165					170					175		
Val	His	Asn	Ser	Thr	Thr	Trp	His	Ser	Asp	Tyr	Lys	Val	Lys	Gly	Leu	
			180					185					190			
Cys	Asp	Ser	Asn	Leu	Ile	Ser	Met	Asp	Ile	Thr	Phe	Phe	Ser	Glu	Asp	
		195					200					205				
Gly	Glu	Leu	Ser	Ser	Leu	Gly	Lys	Glu	Gly	Thr	Gly	Phe	Arg	Ser	Asn	
	210					215					220					
Tyr	Phe	Ala	Tyr	Glu	Thr	Gly	Gly	Lys	Ala	Cys	Lys	Met	Gln	Tyr	Cys	
225					230					235					240	
Lys	His	Trp	Gly	Val	Arg	Leu	Pro	Ser	Gly	Val	Trp	Phe	Glu	Met	Ala	
				245					250					255		
Asp	Lys	Asp	Leu	Phe	Ala	Ala	Ala	Arg	Phe	Pro	Glu	Cys	Pro	Glu	Gly	
			260					265					270			
Ser	Ser	Ile	Ser	Ala	Pro	Ser	Gln	Thr	Ser	Val	Asp	Val	Ser	Leu	Ile	
		275					280					285				
Gln	Asp	Val	Glu	Arg	Ile	Leu	Asp	Tyr	Ser	Leu	Cys	Gln	Glu	Thr	Trp	
	290					295					300					
Ser	Lys	Ile	Arg	Ala	Gly	Leu	Pro	Ile	Ser	Pro	Val	Asp	Leu	Ser	Tyr	
305					310					315					320	
Leu	Ala	Pro	Lys	Asn	Pro	Gly	Thr	Gly	Pro	Ala	Phe	Thr	Ile	Ile	Asn	
				325					330					335		
Gly	Thr	Leu	Lys	Tyr	Phe	Glu	Thr	Arg	Tyr	Ile	Arg	Val	Asp	Ile	Ala	
			340					345					350			
Ala	Pro	Ile	Leu	Ser	Arg	Met	Val	Gly	Met	Ile	Ser	Gly	Thr	Thr	Thr	
		355					360					365				
Glu	Arg	Glu	Leu	Trp	Asp	Asp	Trp	Ala	Pro	Tyr	Glu	Asp	Val	Glu	Ile	
	370					375					380					
Gly	Pro	Asn	Gly	Val	Leu	Arg	Thr	Ser	Ser	Gly	Tyr	Lys	Phe	Pro	Leu	
385					390					395					400	
Tyr	Met	Ile	Gly	His	Gly	Met	Leu	Asp	Ser	Asp	Leu	His	Leu	Ser	Ser	
				405					410					415		
Lys	Ala	Gln	Val	Phe	Glu	His	Pro	His	Ile	Gln	Asp	Ala	Ala	Ser	Gln	
			420					425					430			
Leu	Pro	Asp	Asp	Glu	Ser	Leu	Phe	Phe	Gly	Asp	Thr	Gly	Leu	Ser	Lys	
		435					440					445				

Asn Pro Ile Glu Leu Val Glu Gly Trp Phe Ser Ser Trp Lys Ser Ser
450 455 460

Ile Ala Ser Phe Phe Phe Ile Ile Gly Leu Ile Ile Gly Leu Phe Leu
465 470 475 480

Val Leu Arg Val Gly Ile His Leu Cys Ile Lys Leu Lys His Thr Lys
485 490 495

Lys Arg Gln Ile Tyr Thr Asp Ile Glu Met Asn Arg Leu Gly Lys
500 505 510

<210> 42

<211> 295

<212> PRT

<213> Vesicular stomatitis virus

<220>

<221> MOD_RES

<222> (1)..(295)

<223> "Xaa" represents any, other or unknown amino acid

<400> 42

Met Lys Cys Leu Leu Xaa Leu Ala Phe Leu Phe Ile Gly Val Asn Cys
1 5 10 15

Lys Phe Thr Ile Val Phe Pro Tyr Asn Gln Lys Gly Asn Trp Lys Asn
20 25 30

Val Pro Ser Asn Tyr His Tyr Cys Pro Ser Ser Ser Asp Leu Asn Xaa
35 40 45

His Asn Asp Leu Ile Gly Thr Ala Leu Gln Val Lys Met Pro Lys Ser
50 55 60

His Lys Ala Ile Gln Ala Asp Gly Trp Met Cys His Ala Ser Lys Trp
65 70 75 80

Val Thr Thr Cys Asp Phe Arg Trp Tyr Gly Pro Lys Tyr Ile Thr His
85 90 95

Ser Ile Arg Ser Phe Thr Pro Ser Val Glu Gln Cys Lys Glu Ser Ile
100 105 110

Glu Gln Thr Lys Gln Gly Thr Trp Leu Asn Pro Gly Phe Pro Pro Gln
115 120 125

Ser Cys Gly Tyr Ala Thr Val Thr Asp Ala Glu Ala Ala Ile Val Gln
130 135 140

Val Thr Pro His His Val Leu Val Asp Glu Tyr Thr Gly Glu Trp Val
145 150 155 160

Asp Ser Gln Phe Ile Asn Gly Lys Cys Ser Asn Asp Ile Cys Pro Thr
165 170 175

Val His Asn Ser Thr Thr Trp His Ser Asp Tyr Lys Val Lys Gly Leu
 180 185 190
 Cys Asp Ser Asn Leu Ile Ser Met Asp Ile Thr Phe Phe Ser Glu Asp
 195 200 205
 Gly Glu Leu Ser Ser Leu Gly Lys Glu Gly Thr Gly Phe Arg Ser Asn
 210 215 220
 Tyr Phe Ala Tyr Glu Thr Gly Asp Lys Ala Cys Lys Met Gln Tyr Cys
 225 230 235 240
 Lys Arg Trp Gly Val Arg Leu Pro Ser Gly Val Trp Phe Glu Met Ala
 245 250 255
 Asp Lys Asp Leu Phe Ala Ala Ala Arg Phe Pro Glu Cys Pro Glu Gly
 260 265 270
 Ser Ser Ile Ser Ala Pro Ser Gln Thr Ser Val Asp Val Ser Leu Ile
 275 280 285
 Gln Asp Val Glu Arg Ile Leu
 290 295

<210> 43

<211> 234

<212> PRT

<213> Vesicular stomatitis virus

<400> 43

Pro Ser Gln Thr Ser Val Asp Val Ser Leu Ile Gln Asp Val Glu Arg
 1 5 10 15
 Ile Leu Asp Tyr Ser Leu Cys Gln Glu Thr Trp Ser Lys Ile Arg Ala
 20 25 30
 Gly Leu Pro Ile Ser Pro Val Asp Leu Ser Tyr Leu Ala Pro Lys Asn
 35 40 45
 Pro Gly Thr Gly Pro Val Phe Thr Ile Ile Asn Gly Thr Leu Lys Tyr
 50 55 60
 Phe Glu Thr Arg Tyr Ile Arg Val Asp Ile Ala Ala Pro Ile Leu Ser
 65 70 75 80
 Arg Met Val Gly Met Ile Ser Gly Thr Thr Thr Glu Arg Glu Leu Trp
 85 90 95
 Asp Asp Trp Ala Pro Tyr Glu Asp Val Glu Ile Gly Pro Asn Gly Val
 100 105 110
 Leu Arg Thr Ser Ser Gly Tyr Lys Phe Pro Leu Tyr Met Ile Gly His
 115 120 125
 Gly Met Leu Asp Ser Asp Leu His Leu Ser Ser Lys Ala Gln Val Phe

130		135		140
Glu His Pro His Ile Gln Asp Ala Ala Ser Gln Leu Pro Asp Asp Glu				
145		150		155
Thr Leu Phe Phe Gly Asp Thr Gly Leu Ser Lys Asn Pro Ile Glu Phe				
		165		170
Val Glu Gly Trp Phe Ser Ser Trp Lys Ser Ser Ile Ala Ser Phe Phe				
		180		185
Phe Ile Ile Gly Leu Ile Ile Gly Leu Phe Leu Val Leu Arg Val Gly				
		195		200
Ile Tyr Leu Cys Ile Lys Leu Lys His Thr Lys Lys Arg Gln Ile Tyr				
		210		215
Thr Asp Ile Glu Met Asn Arg Leu Gly Lys				
225		230		

<210> 44

<211> 511

<212> PRT

<213> Vesicular stomatitis virus

<220>

<221> MOD_RES

<222> (1)..(511)

<223> "Xaa" represents any, other or unknown amino acid

<400> 44

Met Lys Cys Leu Leu Tyr Leu Ala Phe Leu Phe Ile Gly Val Asn Cys				
1		5		10
Lys Phe Thr Ile Val Phe Pro Tyr Asn Arg Lys Gly Asn Trp Lys Asn				
		20		25
Val Pro Ser Asn Tyr His Tyr Cys Pro Ser Ser Ser Asp Leu Asn Trp				
		35		40
His Asn Asp Leu Ile Gly Thr Ala Leu Gln Val Lys Met Pro Lys Ser				
		50		55
His Lys Ala Ile Gln Ala Asp Gly Trp Met Cys His Ala Ser Lys Trp				
		65		70
Val Thr Thr Cys Asp Phe Arg Trp Tyr Gly Pro Lys Tyr Ile Thr His				
		85		90
Ser Ile Arg Ser Phe Thr Pro Ser Val Glu Gln Cys Lys Glu Ser Ile				
		100		105
Glu Gln Thr Lys Gln Gly Thr Trp Leu Asn Pro Gly Phe Pro Pro Gln				
		115		120
Ser Cys Gly Tyr Ala Thr Val Thr Asp Ala Glu Ala Ala Ile Val Gln				

130		135		140	
Val Thr Pro His His	Val Leu Val Asp Glu Tyr Thr Gly Glu Trp Val				
145	150	155	160		
Asp Ser Gln Phe Ile	Asn Gly Lys Cys Ser Asn Asp Ile Cys Pro Thr				
165	170	175			
Val His Asn Ser Thr Thr Trp His	Ser Asp Tyr Lys Val Lys Gly Leu				
180	185	190			
Cys Asp Ser Asn Leu Ile Ser Met Asp Ile Thr Phe Phe Ser Glu Asp					
195	200	205			
Gly Glu Leu Ser Ser Leu Gly Lys Glu Gly Thr Gly Phe Arg Ser Asn					
210	215	220			
Tyr Phe Ala Tyr Glu Thr Gly Asp Lys Ala Cys Lys Met Gln Tyr Cys					
225	230	235	240		
Lys His Trp Gly Val Arg Leu Pro Ser Gly Val Trp Phe Glu Met Ala					
245	250	255			
Asp Lys Asp Leu Phe Ala Ala Ala Arg Phe Pro Glu Cys Pro Glu Gly					
260	265	270			
Ser Ser Ile Ser Ala Pro Ser Gln Thr Ser Val Asp Val Ser Leu Ile					
275	280	285			
Gln Asp Val Glu Arg Ile Leu Asp Tyr Ser Leu Cys Gln Glu Thr Trp					
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Leu Ala Pro Lys Asn Pro Gly Thr Gly Pro Ala Phe Thr Ile Ile Asn					
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Gly Thr Leu Lys Tyr Phe Glu Thr Arg Tyr Ile Arg Val Asp Ile Ala					
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Ala Pro Ile Leu Ser Arg Met Val Gly Met Ile Ser Gly Thr Thr Thr					
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Glu Arg Glu Leu Trp Asp Asp Trp Ala Pro Tyr Glu Asp Val Glu Ile					
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Gly Pro Asn Gly Val Leu Arg Thr Ser Ser Gly Tyr Lys Phe Pro Leu					
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Tyr Met Ile Gly His Gly Met Leu Asp Ser Asp Leu His Leu Ser Ser					
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Lys Ala Gln Val Phe Glu His Pro His Ile Gln Asp Ala Xaa Ala Gln					
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Leu Pro Asp Asp Glu Thr Leu Phe Phe Gly Asp Thr Gly Leu Ser Lys					

435

440

445

Asn Pro Ile Glu Phe Val Glu Gly Trp Phe Ser Ser Trp Lys Ser Ser
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Ile Ala Ser Phe Phe Phe Ile Ile Gly Leu Ile Ile Gly Leu Phe Leu
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Val Leu Arg Val Gly Ile Tyr Leu Cys Ile Lys Leu Lys His Thr Lys
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<210> 45

<211> 465

<212> PRT

<213> Vesicular stomatitis virus

<400> 45

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Val His Asn Ser Thr Thr Trp His Ser Asp Tyr Lys Val Lys Gly Leu
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Cys Asp Ser Asn Leu Ile Ser Met Asp Ile Thr Phe Phe Ser Glu Asp
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<210> 46

<211> 6330

<212> DNA

<213> Vesicular stomatitis virus

<400> 46

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<213> Vesicular stomatitis virus

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<210> 48

<211> 348

<212> DNA

<213> Vesicular stomatitis virus

<400> 48

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tgtaagcca	atcccattctc	aacatctcag	atgcataaat	ggatgggaag	ttgggttaatg	300
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<210> 49

<211> 6330

<212> DNA

<213> Vesicular stomatitis virus

<220>
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<400> 49

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<210> 50
 <211> 2109
 <212> PRT
 <213> Vesicular stomatitis virus

<400> 50

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Asp	Asp	Tyr	Ala	Thr	Arg	Glu	Phe	Leu	Asn	Pro	Asp	Glu	Arg	Met	Thr
			20					25					30		
Tyr	Leu	Asn	His	Ala	Asp	Tyr	Asn	Leu	Asn	Ser	Pro	Leu	Ile	Ser	Asp
		35					40					45			
Asp	Ile	Asp	Asn	Leu	Ile	Arg	Lys	Phe	Asn	Ser	Leu	Pro	Ile	Pro	Ser
	50					55					60				
Met	Trp	Asp	Ser	Lys	Asn	Trp	Asp	Gly	Val	Leu	Glu	Met	Leu	Thr	Ser
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Cys	Gln	Ala	Asn	Pro	Ile	Ser	Thr	Ser	Gln	Met	His	Lys	Trp	Met	Gly
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Thr	Phe	Ile	Arg	Gly	Trp	Gly	Asn	Lys	Pro	Ile	Glu	Tyr	Ile	Lys	Lys
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145					150					155					160
Phe	Leu	Asp	Leu	His	Lys	Leu	Thr	Leu	Ile	Leu	Asn	Ala	Val	Ser	Glu
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			180					185					190		
Ser	Ser	His	Gly	Thr	Asn	Ile	Cys	Arg	Ile	Arg	Val	Pro	Ser	Leu	Gly
		195					200					205			
Pro	Thr	Phe	Ile	Ser	Glu	Gly	Trp	Ala	Tyr	Phe	Lys	Lys	Leu	Asp	Ile
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Leu	Met	Asp	Arg	Asn	Phe	Leu	Leu	Met	Val	Lys	Asp	Val	Ile	Ile	Gly
225					230					235					240
Arg	Met	Gln	Thr	Val	Leu	Ser	Met	Val	Cys	Arg	Ile	Asp	Asn	Leu	Phe
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Ser	Glu	Gln	Asp	Ile	Phe	Ser	Leu	Leu	Asn	Ile	Tyr	Arg	Ile	Gly	Asp
			260					265					270		

Lys	Ile	Val	Glu	Arg	Gln	Gly	Asn	Phe	Ser	Tyr	Asp	Leu	Ile	Lys	Met	275	280	285	
Val	Glu	Pro	Ile	Cys	Asn	Leu	Lys	Leu	Met	Lys	Leu	Ala	Arg	Glu	Ser	290	295	300	
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Ser	Val	Asp	Glu	Gly	Ala	Lys	Ile	Asp	Arg	Gly	Ile	Arg	Phe	Leu	His	325	330	335	
Asp	Gln	Ile	Met	Ser	Val	Lys	Thr	Val	Asp	Leu	Thr	Leu	Val	Ile	Tyr	340	345	350	
Gly	Ser	Phe	Arg	His	Trp	Gly	His	Pro	Phe	Ile	Asp	Tyr	Tyr	Thr	Gly	355	360	365	
Leu	Glu	Lys	Leu	His	Ser	Gln	Val	Thr	Met	Lys	Lys	Asp	Ile	Asp	Val	370	375	380	
Ser	Tyr	Ala	Lys	Ala	Leu	Ala	Ser	Asp	Leu	Ala	Arg	Ile	Val	Leu	Phe	385	390	395	400
Gln	Gln	Phe	Asn	Asp	His	Lys	Lys	Trp	Phe	Val	Asn	Gly	Asp	Leu	Leu	405	410	415	
Pro	His	Asp	His	Pro	Phe	Lys	Ser	His	Val	Lys	Glu	Asn	Thr	Trp	Pro	420	425	430	
Thr	Ala	Ala	Gln	Val	Gln	Asp	Phe	Gly	Asp	Lys	Trp	His	Glu	Leu	Pro	435	440	445	
Leu	Ile	Lys	Cys	Phe	Glu	Ile	Pro	Asp	Leu	Leu	Asp	Pro	Ser	Ile	Ile	450	455	460	
Tyr	Ser	Asp	Lys	Ser	His	Ser	Met	Asn	Arg	Ser	Glu	Val	Leu	Lys	His	465	470	475	480
Val	Arg	Met	Asn	Pro	Asn	Thr	Pro	Ile	Pro	Ser	Lys	Lys	Val	Leu	Gln	485	490	495	
Thr	Met	Leu	Asp	Thr	Lys	Ala	Thr	Asn	Trp	Lys	Glu	Phe	Leu	Lys	Glu	500	505	510	
Ile	Asp	Glu	Lys	Gly	Leu	Asp	Asp	Asp	Asp	Leu	Ile	Ile	Gly	Leu	Lys	515	520	525	
Gly	Lys	Glu	Arg	Glu	Leu	Lys	Leu	Ala	Gly	Arg	Phe	Phe	Ser	Leu	Met	530	535	540	
Ser	Trp	Lys	Leu	Arg	Glu	Tyr	Phe	Val	Ile	Thr	Glu	Tyr	Leu	Ile	Lys	545	550	555	560
Thr	His	Phe	Val	Pro	Met	Phe	Lys	Gly	Leu	Thr	Met	Ala	Asp	Asp	Leu	565	570	575	

Thr	Ala	Val	Ile	Lys	Lys	Met	Leu	Asp	Ser	Ser	Ser	Gly	Gln	Gly	Leu	580	585	590
Lys	Ser	Tyr	Glu	Ala	Ile	Cys	Ile	Ala	Asn	His	Ile	Asp	Tyr	Glu	Lys	595	600	605
Trp	Asn	Asn	His	Gln	Arg	Lys	Leu	Ser	Asn	Gly	Pro	Val	Phe	Arg	Val	610	615	620
Met	Gly	Gln	Phe	Leu	Gly	Tyr	Pro	Ser	Leu	Ile	Glu	Arg	Thr	His	Glu	625	630	635
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Arg	Val	His	Asn	Asn	Thr	Leu	Ile	Asn	Ser	Thr	Ser	Gln	Arg	Val	Cys	660	665	670
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Thr	Asn	Asp	Gln	Ile	Pro	Thr	Cys	Ala	Asn	Ile	Met	Ser	Ser	Val	Ser	805	810	815
Thr	Asn	Ala	Leu	Thr	Val	Ala	His	Phe	Ala	Glu	Asn	Pro	Ile	Asn	Ala	820	825	830
Met	Ile	Gln	Tyr	Asn	Tyr	Phe	Gly	Thr	Phe	Ala	Arg	Leu	Leu	Leu	Met	835	840	845
Met	His	Asp	Pro	Ala	Leu	Arg	Gln	Ser	Leu	Tyr	Glu	Val	Gln	Asp	Lys	850	855	860
Ile	Pro	Gly	Leu	His	Ser	Ser	Thr	Phe	Lys	Tyr	Ala	Met	Leu	Tyr	Leu	865	870	875

Asp	Pro	Ser	Ile	Gly	Gly	Val	Ser	Gly	Met	Ser	Leu	Ser	Arg	Phe	Leu	
				885					890					895		
Ile	Arg	Ala	Phe	Pro	Asp	Pro	Val	Thr	Glu	Ser	Leu	Ser	Phe	Trp	Arg	
			900					905					910			
Phe	Ile	His	Val	His	Ala	Arg	Ser	Glu	His	Leu	Lys	Glu	Met	Ser	Ala	
		915					920					925				
Val	Phe	Gly	Asn	Pro	Glu	Ile	Ala	Lys	Phe	Arg	Ile	Thr	His	Ile	Asp	
		930				935					940					
Lys	Leu	Val	Glu	Asp	Pro	Thr	Ser	Leu	Asn	Ile	Ala	Met	Gly	Met	Ser	
945					950					955					960	
Pro	Ala	Asn	Leu	Leu	Lys	Thr	Glu	Val	Lys	Lys	Cys	Leu	Ile	Glu	Ser	
				965					970					975		
Arg	Gln	Thr	Ile	Arg	Asn	Gln	Val	Ile	Lys	Asp	Ala	Thr	Ile	Tyr	Leu	
			980					985					990			
Tyr	His	Glu	Glu	Asp	Arg	Leu	Arg	Ser	Phe	Leu	Trp	Ser	Ile	Asn	Pro	
		995				1000						1005				
Leu	Phe	Pro	Arg	Phe	Leu	Ser	Glu	Phe	Lys	Ser	Gly	Thr	Phe	Leu	Gly	
	1010					1015					1020					
Val	Ala	Asp	Gly	Leu	Ile	Ser	Leu	Phe	Gln	Asn	Ser	Arg	Thr	Ile	Arg	
1025					1030					1035					1040	
Asn	Ser	Phe	Lys	Lys	Lys	Tyr	His	Arg	Glu	Leu	Asp	Asp	Leu	Ile	Val	
				1045					1050					1055		
Arg	Ser	Glu	Val	Ser	Ser	Leu	Thr	His	Leu	Gly	Lys	Leu	His	Leu	Arg	
			1060					1065					1070			
Arg	Gly	Ser	Cys	Lys	Met	Trp	Thr	Cys	Ser	Ala	Thr	His	Ala	Asp	Thr	
		1075				1080						1085				
Leu	Arg	Tyr	Lys	Ser	Trp	Gly	Arg	Thr	Val	Ile	Gly	Thr	Thr	Val	Pro	
	1090					1095					1100					
His	Pro	Leu	Glu	Met	Leu	Gly	Pro	Gln	His	Arg	Lys	Glu	Thr	Pro	Cys	
1105					1110					1115					1120	
Ala	Pro	Cys	Asn	Thr	Ser	Gly	Phe	Asn	Tyr	Val	Ser	Val	His	Cys	Pro	
				1125					1130					1135		
Asp	Gly	Ile	His	Asp	Val	Phe	Ser	Ser	Arg	Gly	Pro	Leu	Pro	Ala	Tyr	
			1140					1145					1150			
Leu	Gly	Ser	Lys	Thr	Ser	Glu	Ser	Thr	Ser	Ile	Leu	Gln	Pro	Trp	Glu	
		1155					1160					1165				
Arg	Glu	Ser	Lys	Val	Pro	Leu	Ile	Lys	Arg	Ala	Thr	Arg	Leu	Arg	Asp	
	1170					1175					1180					

Ala Ile Ser Trp Phe Val Glu Pro Asp Ser Lys Leu Ala Met Thr Ile
 1185 1190 1195 1200
 Leu Ser Asn Ile His Ser Leu Thr Gly Glu Glu Trp Thr Lys Arg Gln
 1205 1210 1215
 His Gly Phe Lys Arg Thr Gly Ser Ala Leu His Arg Phe Ser Thr Ser
 1220 1225 1230
 Arg Met Ser His Gly Gly Phe Ala Ser Gln Ser Thr Ala Ala Leu Thr
 1235 1240 1245
 Arg Leu Met Ala Thr Thr Asp Thr Met Arg Asp Leu Gly Asp Gln Asn
 1250 1255 1260
 Phe Asp Phe Leu Phe Gln Ala Thr Leu Leu Tyr Ala Gln Ile Thr Thr
 1265 1270 1275 1280
 Thr Val Ala Arg Asp Gly Trp Ile Thr Ser Cys Thr Asp His Tyr His
 1285 1290 1295
 Ile Ala Cys Lys Ser Cys Leu Arg Pro Ile Glu Glu Ile Thr Leu Asp
 1300 1305 1310
 Ser Ser Met Asp Tyr Thr Pro Pro Asp Val Ser His Val Leu Lys Thr
 1315 1320 1325
 Trp Arg Asn Gly Glu Gly Ser Trp Gly Gln Glu Ile Lys Gln Ile Tyr
 1330 1335 1340
 Pro Leu Glu Gly Asn Trp Lys Asn Leu Ala Pro Ala Glu Gln Ser Tyr
 1345 1350 1355 1360
 Gln Val Gly Arg Cys Ile Gly Phe Leu Tyr Gly Asp Leu Ala Tyr Arg
 1365 1370 1375
 Lys Ser Thr His Ala Glu Asp Ser Ser Leu Phe Pro Leu Ser Ile Gln
 1380 1385 1390
 Gly Arg Ile Arg Gly Arg Gly Phe Leu Lys Gly Leu Leu Asp Gly Leu
 1395 1400 1405
 Met Arg Ala Ser Cys Cys Gln Val Ile His Arg Arg Ser Leu Ala His
 1410 1415 1420
 Leu Lys Arg Pro Ala Asn Ala Val Tyr Gly Gly Leu Ile Tyr Leu Ile
 1425 1430 1435 1440
 Asp Lys Leu Ser Val Ser Pro Pro Phe Leu Ser Leu Thr Arg Ser Gly
 1445 1450 1455
 Pro Ile Arg Asp Glu Leu Glu Thr Ile Pro His Lys Ile Pro Thr Ser
 1460 1465 1470
 Tyr Pro Thr Ser Asn Arg Asp Met Gly Val Ile Val Arg Asn Tyr Phe
 1475 1480 1485

Lys Tyr Gln Cys Arg Leu Ile Glu Lys Gly Lys Tyr Arg Ser His Tyr		
1490	1495	1500
Ser Gln Leu Trp Leu Phe Ser Asp Val Leu Ser Ile Asp Phe Ile Gly		
1505	1510	1515 1520
Pro Phe Ser Ile Ser Thr Thr Leu Leu Gln Ile Leu Tyr Lys Pro Phe		
	1525	1530 1535
Leu Ser Gly Lys Asp Lys Asn Glu Leu Arg Glu Leu Ala Asn Leu Ser		
	1540	1545 1550
Ser Leu Leu Arg Ser Gly Glu Gly Trp Glu Asp Ile His Val Lys Phe		
	1555	1560 1565
Phe Thr Lys Asp Ile Leu Leu Cys Pro Glu Glu Ile Arg His Ala Cys		
	1570	1575 1580
Lys Phe Gly Ile Ala Lys Asp Asn Asn Lys Asp Met Ser Tyr Pro Pro		
1585	1590	1595 1600
Trp Gly Arg Glu Ser Arg Gly Thr Ile Thr Thr Ile Pro Val Tyr Tyr		
	1605	1610 1615
Thr Thr Thr Pro Tyr Pro Lys Met Leu Glu Met Pro Pro Arg Ile Gln		
	1620	1625 1630
Asn Pro Leu Leu Ser Gly Ile Arg Leu Gly Gln Leu Pro Thr Gly Ala		
	1635	1640 1645
His Tyr Lys Ile Arg Ser Ile Leu His Gly Met Gly Ile His Tyr Arg		
	1650	1655 1660
Asp Phe Leu Ser Cys Gly Asp Gly Ser Gly Gly Met Thr Ala Ala Leu		
1665	1670	1675 1680
Leu Arg Glu Asn Val His Ser Arg Gly Ile Phe Asn Ser Leu Leu Glu		
	1685	1690 1695
Leu Ser Gly Ser Val Met Arg Gly Ala Ser Pro Glu Pro Pro Ser Ala		
	1700	1705 1710
Leu Glu Thr Leu Gly Gly Asp Lys Ser Arg Cys Val Asn Gly Glu Thr		
	1715	1720 1725
Cys Trp Glu Tyr Pro Ser Asp Leu Cys Asp Pro Arg Thr Trp Asp Tyr		
	1730	1735 1740
Phe Leu Arg Leu Lys Ala Gly Leu Gly Leu Gln Ile Asp Leu Ile Val		
1745	1750	1755 1760
Met Asp Met Glu Val Arg Asp Ser Ser Thr Ser Leu Lys Ile Glu Thr		
	1765	1770 1775
Asn Val Arg Asn Tyr Val His Arg Ile Leu Asp Glu Gln Gly Val Leu		
	1780	1785 1790

Ile Tyr Lys Thr Tyr Gly Thr Tyr Ile Cys Glu Ser Glu Lys Asn Ala		
1795	1800	1805
Val Thr Ile Leu Gly Pro Met Phe Lys Thr Val Asp Leu Val Gln Thr		
1810	1815	1820
Glu Phe Ser Ser Ser Gln Thr Ser Glu Val Tyr Met Val Cys Lys Gly		
1825	1830	1835 1840
Leu Lys Lys Leu Ile Asp Glu Pro Asn Pro Asp Trp Ser Ser Ile Asn		
1845	1850	1855
Glu Ser Trp Lys Asn Leu Tyr Ala Phe Gln Ser Ser Glu Gln Glu Phe		
1860	1865	1870
Ala Arg Ala Lys Lys Val Ser Thr Tyr Phe Thr Leu Thr Gly Ile Pro		
1875	1880	1885
Ser Gln Phe Ile Pro Asp Pro Phe Val Asn Ile Glu Thr Met Leu Gln		
1890	1895	1900
Ile Phe Gly Val Pro Thr Gly Val Ser His Ala Ala Ala Leu Lys Ser		
1905	1910	1915 1920
Ser Asp Arg Pro Ala Asp Leu Leu Thr Ile Ser Leu Phe Tyr Met Ala		
1925	1930	1935
Ile Ile Ser Tyr Tyr Asn Ile Asn His Ile Arg Val Gly Pro Ile Pro		
1940	1945	1950
Pro Asn Pro Pro Ser Asp Gly Ile Ala Gln Asn Val Gly Ile Ala Ile		
1955	1960	1965
Thr Gly Ile Ser Phe Trp Leu Ser Leu Met Glu Lys Asp Ile Pro Leu		
1970	1975	1980
Tyr Gln Gln Cys Leu Ala Val Ile Gln Gln Ser Phe Pro Ile Arg Trp		
1985	1990	1995 2000
Glu Ala Val Ser Val Lys Gly Gly Tyr Lys Gln Lys Trp Ser Thr Arg		
2005	2010	2015
Gly Asp Gly Leu Pro Lys Asp Thr Arg Thr Ser Asp Ser Leu Ala Pro		
2020	2025	2030
Ile Gly Asn Trp Ile Arg Ser Leu Glu Leu Val Arg Asn Gln Val Arg		
2035	2040	2045
Leu Asn Pro Phe Asn Glu Ile Leu Phe Asn Gln Leu Cys Arg Thr Val		
2050	2055	2060
Asp Asn His Leu Lys Trp Ser Asn Leu Arg Arg Asn Thr Gly Met Ile		
2065	2070	2075 2080
Glu Trp Ile Asn Arg Arg Ile Ser Lys Glu Asp Arg Ser Ile Leu Met		
2085	2090	2095

Leu Lys Ser Asp Leu His Glu Glu Asn Ser Trp Arg Asp
 2100 2105

<210> 51

<211> 1753

<212> PRT

<213> Vesicular stomatitis virus

<220>

<221> MOD_RES

<222> (1)..(1753)

<223> "Xaa" represents any, other or unknown amino acid

<400> 51

His Trp Gly His Pro Phe Ile Asp Tyr Tyr Ala Gly Leu Glu Lys Leu
 1 5 10 15

His Ser Gln Val Thr Xaa Lys Lys Asp Ile Asp Val Ser Tyr Ala Lys
 20 25 30

Ala Leu Ala Ser Asp Leu Ala Arg Ile Val Leu Phe Gln Gln Phe Asn
 35 40 45

Asp His Xaa Lys Trp Phe Val Asn Gly Asp Leu Leu Pro His Asp His
 50 55 60

Pro Phe Lys Ser His Val Lys Glu Asn Thr Trp Pro Thr Ala Ala Gln
 65 70 75 80

Val Gln Asp Phe Gly Asp Lys Trp His Glu Leu Pro Leu Ile Lys Cys
 85 90 95

Phe Glu Ile Pro Asp Leu Leu Asp Pro Ser Ile Ile Tyr Ser Asp Lys
 100 105 110

Ser His Ser Met Asn Arg Ser Glu Val Leu Lys His Val Arg Met Asn
 115 120 125

Pro Asn Thr Pro Ile Pro Ser Lys Lys Val Leu Gln Thr Met Leu Asp
 130 135 140

Thr Lys Ala Thr Asn Trp Lys Glu Phe Leu Lys Glu Ile Asp Glu Lys
 145 150 155 160

Gly Leu Asp Asp Asp Asp Leu Ile Ile Gly Leu Lys Gly Lys Glu Arg
 165 170 175

Glu Leu Lys Leu Ala Gly Arg Phe Phe Ser Leu Met Ser Trp Lys Leu
 180 185 190

Arg Glu Tyr Phe Val Ile Thr Glu Tyr Leu Ile Lys Thr His Phe Val
 195 200 205

Pro Met Phe Lys Gly Leu Thr Met Ala Asp Asp Leu Thr Ala Val Ile
 210 215 220

Lys 225	Lys	Met	Leu	Asp	Ser 230	Ser	Ser	Ser	Gly	Gln	Gly 235	Leu	Lys	Ser	Tyr	Glu 240
Ala	Ile	Cys	Ile	Ala 245	Asn	His	Ile	Asp	Tyr 250	Glu	Lys	Trp	Asn	Asn	His 255	
Gln	Arg	Lys	Leu 260	Ser	Asn	Gly	Pro	Val 265	Phe	Arg	Val	Met	Gly 270	Gln	Phe	
Leu	Gly 275	Tyr	Pro	Ser	Leu	Ile	Glu 280	Arg	Thr	His	Glu 285	Phe	Phe	Glu	Lys	
Ser 290	Leu	Ile	Tyr	Tyr	Asn	Gly 295	Arg	Pro	Asp	Leu	Met 300	Arg	Val	His	Asn	
Asn 305	Thr	Leu	Ile	Asn	Ser	Thr	Ser	Gln	Arg	Val 315	Cys	Trp	Gln	Gly	Gln 320	
Glu	Gly	Gly	Leu 325	Glu	Gly	Leu	Arg	Gln	Lys	Gly 330	Trp	Ser	Ile	Leu	Asn 335	
Leu	Leu	Val 340	Ile	Gln	Arg	Glu	Ala	Lys 345	Ile	Arg	Asn	Thr	Ala 350	Val	Lys	
Val	Leu 355	Ala	Gln	Gly	Asp	Asn	Gln 360	Val	Ile	Cys	Thr 365	Gln	Tyr	Lys	Thr	
Lys 370	Lys	Ser	Arg	Asn	Val	Val 375	Glu	Leu	Gln	Gly 380	Ala	Leu	Asn	Gln	Met	
Val 385	Ser	Asn	Asn	Glu	Lys 390	Ile	Met	Thr	Ala	Ile 395	Lys	Ile	Gly	Thr	Gly 400	
Lys	Leu	Gly	Leu 405	Leu	Ile	Asn	Asp	Asp	Glu 410	Thr	Met	Gln	Ser	Ala	Asp 415	
Tyr	Leu	Asn	Tyr 420	Gly	Lys	Ile	Pro	Ile	Phe	Arg	Gly 425	Val	Ile	Arg	Gly 430	
Leu	Glu	Thr 435	Lys	Arg	Trp	Ser	Arg 440	Val	Thr	Cys	Val 445	Thr	Asn	Asp	Gln	
Ile 450	Pro	Thr	Cys	Ala	Asn 455	Ile	Met	Ser	Ser	Val 460	Ser	Thr	Asn	Ala	Leu	
Thr 465	Val	Ala	His	Phe	Ala 470	Glu	Asn	Pro	Ile	Asn 475	Ala	Met	Ile	Gln	Tyr 480	
Asn	Tyr	Phe	Gly 485	Thr	Phe	Ala	Arg	Leu	Leu 490	Leu	Met	Met	His	Asp 495	Pro	
Ala	Leu	Arg	Gln 500	Ser	Leu	Tyr	Glu	Val 505	Gln	Asp	Lys	Ile	Pro	Gly	Leu 510	
His 515	Ser	Ser	Thr	Phe	Lys	Tyr	Ala 520	Met	Leu	Tyr	Leu	Asp 525	Pro	Ser	Ile	

Gly	Gly	Val	Ser	Gly	Met	Ser	Leu	Ser	Arg	Phe	Leu	Ile	Arg	Ala	Phe		
530						535					540						
Pro	Asp	Pro	Val	Thr	Glu	Ser	Leu	Ser	Phe	Trp	Arg	Phe	Ile	His	Val		
545					550					555					560		
His	Ala	Arg	Ser	Glu	His	Leu	Lys	Glu	Met	Ser	Ala	Val	Phe	Gly	Asn		
				565					570					575			
Pro	Glu	Ile	Ala	Lys	Phe	Arg	Ile	Thr	His	Ile	Asp	Lys	Leu	Val	Glu		
			580					585					590				
Asp	Pro	Thr	Ser	Leu	Asn	Ile	Ala	Met	Gly	Met	Ser	Pro	Ala	Asn	Leu		
		595					600					605					
Leu	Lys	Thr	Glu	Val	Lys	Lys	Cys	Leu	Ile	Glu	Ser	Arg	Gln	Thr	Ile		
	610					615					620						
Arg	Asn	Gln	Val	Ile	Lys	Asp	Ala	Thr	Ile	Tyr	Leu	Tyr	His	Glu	Glu		
625					630					635					640		
Asp	Arg	Leu	Arg	Ser	Phe	Leu	Trp	Ser	Ile	Asn	Pro	Leu	Phe	Pro	Arg		
				645					650					655			
Phe	Leu	Ser	Glu	Phe	Lys	Ser	Gly	Thr	Phe	Leu	Gly	Val	Ala	Asp	Gly		
			660					665					670				
Leu	Ile	Ser	Leu	Phe	Gln	Asn	Ser	Arg	Thr	Ile	Arg	Asn	Ser	Phe	Lys		
		675					680					685					
Lys	Lys	Tyr	His	Arg	Glu	Leu	Asp	Asp	Leu	Ile	Val	Arg	Ser	Glu	Val		
	690					695					700						
Ser	Ser	Leu	Thr	His	Leu	Gly	Lys	Leu	His	Leu	Arg	Arg	Gly	Ser	Cys		
705					710					715					720		
Lys	Met	Trp	Thr	Cys	Ser	Ala	Thr	His	Ala	Asp	Thr	Leu	Arg	Tyr	Lys		
				725					730					735			
Ser	Trp	Gly	Arg	Thr	Val	Ile	Gly	Thr	Thr	Val	Pro	His	Pro	Leu	Glu		
			740					745					750				
Met	Leu	Gly	Pro	Gln	His	Arg	Lys	Glu	Thr	Pro	Cys	Ala	Pro	Cys	Asn		
		755					760					765					
Thr	Ser	Gly	Phe	Asn	Tyr	Val	Ser	Val	His	Cys	Pro	Asp	Gly	Ile	His		
		770				775					780						
Asp	Val	Phe	Ser	Ser	Arg	Gly	Pro	Leu	Pro	Ala	Tyr	Leu	Gly	Ser	Lys		
785					790					795					800		
Thr	Ser	Glu	Ser	Thr	Ser	Ile	Leu	Gln	Pro	Trp	Glu	Arg	Glu	Ser	Lys		
				805					810					815			
Val	Pro	Leu	Ile	Lys	Arg	Ala	Thr	Arg	Leu	Arg	Asp	Ala	Ile	Ser	Trp		
			820					825					830				

Phe	Val	Glu	Pro	Asp	Ser	Lys	Leu	Ala	Met	Thr	Ile	Leu	Ser	Asn	Ile		
		835					840					845					
His	Ser	Leu	Thr	Gly	Glu	Glu	Trp	Thr	Lys	Arg	Gln	His	Gly	Phe	Lys		
		850				855					860						
Arg	Thr	Gly	Ser	Ala	Leu	His	Arg	Phe	Ser	Thr	Ser	Arg	Met	Ser	His		
		865			870					875					880		
Gly	Gly	Phe	Ala	Ser	Gln	Ser	Thr	Ala	Ala	Leu	Thr	Arg	Leu	Met	Ala		
				885					890					895			
Thr	Thr	Asp	Thr	Met	Arg	Asp	Leu	Gly	Asp	Gln	Asn	Phe	Asp	Phe	Leu		
			900					905					910				
Phe	Gln	Ala	Thr	Leu	Leu	Tyr	Ala	Gln	Ile	Thr	Thr	Thr	Val	Ala	Arg		
		915					920						925				
Asp	Gly	Trp	Ile	Thr	Ser	Cys	Thr	Asp	His	Tyr	His	Ile	Ala	Cys	Lys		
		930				935					940						
Ser	Cys	Leu	Arg	Pro	Ile	Glu	Glu	Ile	Thr	Leu	Asp	Ser	Ser	Met	Asp		
		945			950					955					960		
Tyr	Thr	Pro	Pro	Asp	Val	Ser	His	Val	Leu	Lys	Thr	Trp	Arg	Asn	Gly		
				965					970					975			
Glu	Gly	Ser	Trp	Gly	Gln	Glu	Ile	Lys	Gln	Ile	Tyr	Pro	Leu	Glu	Gly		
			980					985					990				
Asn	Trp	Lys	Asn	Leu	Ala	Pro	Ala	Glu	Gln	Ser	Tyr	Gln	Val	Gly	Arg		
		995				1000						1005					
Cys	Ile	Gly	Phe	Leu	Tyr	Gly	Asp	Leu	Ala	Tyr	Arg	Lys	Ser	Thr	His		
	1010					1015					1020						
Ala	Glu	Asp	Ser	Ser	Leu	Phe	Pro	Leu	Ser	Ile	Gln	Gly	Arg	Ile	Arg		
	1025				1030					1035					1040		
Gly	Arg	Gly	Phe	Leu	Lys	Gly	Leu	Leu	Asp	Gly	Leu	Met	Arg	Ala	Ser		
			1045					1050						1055			
Cys	Cys	Gln	Val	Ile	His	Arg	Arg	Ser	Leu	Ala	His	Leu	Lys	Arg	Pro		
		1060					1065						1070				
Ala	Asn	Ala	Val	Tyr	Gly	Gly	Leu	Ile	Tyr	Leu	Ile	Asp	Lys	Leu	Ser		
	1075					1080						1085					
Val	Ser	Pro	Pro	Phe	Leu	Ser	Leu	Thr	Arg	Ser	Gly	Pro	Ile	Arg	Asp		
	1090				1095						1100						
Glu	Leu	Glu	Thr	Ile	Pro	His	Lys	Ile	Pro	Thr	Ser	Tyr	Pro	Thr	Ser		
	1105				1110				1115						1120		
Asn	Arg	Asp	Met	Gly	Val	Ile	Val	Arg	Asn	Tyr	Phe	Lys	Tyr	Gln	Cys		
			1125					1130						1135			

Arg Leu Ile Glu Lys Gly Lys Tyr Arg Ser His Tyr Ser Gln Leu Trp
 1140 1145 1150
 Leu Phe Ser Asp Val Leu Ser Ile Asp Phe Ile Gly Pro Phe Ser Ile
 1155 1160 1165
 Ser Thr Thr Leu Leu Gln Ile Leu Tyr Lys Pro Phe Leu Ser Gly Lys
 1170 1175 1180
 Asp Lys Asn Glu Leu Arg Glu Leu Ala Asn Leu Ser Ser Leu Leu Arg
 1185 1190 1195 1200
 Ser Gly Glu Gly Trp Glu Asp Ile His Val Lys Phe Phe Thr Lys Asp
 1205 1210 1215
 Ile Leu Leu Cys Pro Glu Glu Ile Arg His Ala Cys Lys Phe Gly Ile
 1220 1225 1230
 Ala Lys Asp Asn Asn Lys Asp Met Ser Tyr Pro Pro Trp Gly Arg Glu
 1235 1240 1245
 Ser Arg Gly Thr Ile Thr Thr Ile Pro Val Tyr Tyr Thr Thr Thr Pro
 1250 1255 1260
 Tyr Pro Lys Met Leu Glu Met Pro Pro Arg Ile Gln Asn Pro Leu Leu
 1265 1270 1275 1280
 Ser Gly Ile Arg Leu Gly Gln Leu Pro Thr Gly Ala His Tyr Lys Ile
 1285 1290 1295
 Arg Ser Ile Leu His Gly Met Gly Ile His Tyr Arg Asp Phe Leu Ser
 1300 1305 1310
 Cys Gly Asp Gly Ser Gly Gly Met Thr Ala Ala Leu Leu Arg Glu Asn
 1315 1320 1325
 Val His Ser Arg Gly Ile Phe Asn Ser Leu Leu Glu Leu Ser Gly Ser
 1330 1335 1340
 Val Met Arg Gly Ala Ser Pro Glu Pro Pro Ser Ala Leu Glu Thr Leu
 1345 1350 1355 1360
 Gly Gly Asp Lys Ser Arg Cys Val Asn Gly Glu Thr Cys Trp Glu Tyr
 1365 1370 1375
 Pro Ser Asp Leu Cys Asp Pro Arg Thr Trp Asp Tyr Phe Leu Arg Leu
 1380 1385 1390
 Lys Ala Gly Leu Gly Leu Gln Ile Asp Leu Ile Val Met Asp Met Glu
 1395 1400 1405
 Val Arg Asp Ser Ser Thr Ser Leu Lys Ile Glu Thr Asn Val Arg Asn
 1410 1415 1420
 Tyr Val His Arg Ile Leu Asp Glu Gln Gly Val Leu Ile Tyr Lys Thr
 1425 1430 1435 1440

Tyr Gly Thr Tyr Ile Cys Glu Ser Glu Lys Asn Ala Val Thr Ile Leu
 1445 1450 1455
 Gly Pro Met Phe Lys Thr Val Asp Leu Val Gln Thr Glu Phe Ser Ser
 1460 1465 1470
 Ser Gln Thr Ser Glu Val Tyr Met Val Cys Lys Gly Leu Lys Lys Leu
 1475 1480 1485
 Ile Asp Glu Pro Asn Pro Asp Trp Ser Ser Ile Asn Glu Ser Trp Lys
 1490 1495 1500
 Asn Leu Tyr Ala Phe Gln Ser Ser Glu Gln Glu Phe Ala Arg Ala Lys
 1505 1510 1515 1520
 Lys Val Ser Thr Tyr Phe Thr Leu Thr Gly Ile Pro Ser Gln Phe Ile
 1525 1530 1535
 Pro Asp Pro Phe Val Asn Ile Glu Thr Met Leu Gln Ile Phe Gly Val
 1540 1545 1550
 Pro Thr Gly Val Ser His Ala Ala Ala Leu Lys Ser Ser Asp Arg Pro
 1555 1560 1565
 Ala Asp Leu Leu Thr Ile Ser Leu Phe Tyr Met Ala Ile Ile Ser Tyr
 1570 1575 1580
 Tyr Asn Ile Asn His Ile Arg Val Gly Pro Ile Pro Pro Asn Pro Pro
 1585 1590 1595 1600
 Ser Asp Gly Ile Ala Gln Asn Val Gly Ile Ala Ile Thr Gly Ile Ser
 1605 1610 1615
 Phe Trp Leu Ser Leu Met Glu Lys Asp Ile Pro Leu Tyr Gln Gln Cys
 1620 1625 1630
 Leu Ala Val Ile Gln Gln Ser Phe Pro Ile Arg Trp Glu Ala Val Ser
 1635 1640 1645
 Val Lys Gly Gly Tyr Lys Gln Lys Trp Ser Thr Arg Gly Asp Gly Leu
 1650 1655 1660
 Pro Lys Asp Thr Arg Ile Ser Asp Ser Leu Ala Pro Ile Gly Asn Trp
 1665 1670 1675 1680
 Ile Arg Ser Leu Glu Leu Val Arg Asn Gln Val Arg Leu Asn Pro Phe
 1685 1690 1695
 Asn Glu Ile Leu Phe Asn Gln Leu Cys Arg Thr Val Asp Asn His Leu
 1700 1705 1710
 Lys Trp Ser Asn Leu Arg Lys Asn Thr Gly Met Ile Glu Trp Ile Asn
 1715 1720 1725
 Arg Arg Ile Ser Lys Glu Asp Arg Ser Ile Leu Met Leu Lys Ser Asp
 1730 1735 1740

Leu His Glu Glu Asn Ser Trp Arg Asp
1745 1750

<210> 52

<211> 2109

<212> PRT

<213> Vesicular stomatitis virus

<220>

<221> MOD_RES

<222> (1)..(2109)

<223> "Xaa" represents any, other or unknown amino acid

<400> 52

Met Glu Val His Asp Phe Glu Thr Asp Glu Phe Asn Asp Phe Asn Glu
1 5 10 15

Asp Asp Tyr Ala Thr Arg Glu Phe Leu Asn Pro Asp Glu Arg Met Thr
20 25 30

Tyr Leu Asn His Ala Asp Tyr Asn Leu Asn Ser Pro Leu Ile Ser Asp
35 40 45

Asp Ile Asp Asn Leu Ile Arg Lys Phe Asn Ser Leu Pro Ile Pro Ser
50 55 60

Met Trp Asp Ser Lys Asn Trp Asp Gly Val Leu Glu Met Leu Thr Ser
65 70 75 80

Cys Gln Ala Asn Pro Ile Ser Thr Ser Gln Met His Lys Trp Met Gly
85 90 95

Ser Trp Leu Met Ser Asp Asn His Asp Ala Ser Gln Gly Tyr Ser Phe
100 105 110

Leu His Glu Val Asp Lys Glu Ala Glu Ile Thr Phe Asp Val Val Glu
115 120 125

Thr Phe Ile Arg Gly Trp Gly Asn Lys Pro Ile Glu Tyr Ile Lys Lys
130 135 140

Glu Arg Trp Thr Asp Ser Phe Lys Ile Leu Ala Tyr Leu Cys Gln Lys
145 150 155 160

Phe Leu Asp Leu His Lys Leu Thr Leu Ile Leu Asn Ala Val Ser Glu
165 170 175

Val Glu Leu Leu Asn Leu Ala Arg Thr Phe Lys Gly Lys Val Arg Arg
180 185 190

Ser Ser His Gly Thr Asn Ile Cys Arg Leu Arg Val Pro Ser Leu Gly
195 200 205

Pro Thr Phe Ile Ser Glu Gly Trp Ala Tyr Phe Lys Lys Leu Asp Ile
210 215 220

Leu	Met	Asp	Arg	Asn	Phe	Leu	Leu	Met	Val	Lys	Asp	Val	Ile	Ile	Gly	
225					230					235					240	
Arg	Met	Gln	Thr	Val	Leu	Ser	Met	Val	Cys	Arg	Ile	Asp	Asn	Leu	Phe	
				245					250					255		
Ser	Glu	Gln	Asp	Ile	Phe	Ser	Leu	Leu	Asn	Ile	Tyr	Arg	Ile	Gly	Asp	
			260					265					270			
Lys	Ile	Val	Glu	Arg	Gln	Gly	Asn	Phe	Ser	Tyr	Asp	Leu	Ile	Lys	Met	
		275					280					285				
Val	Glu	Pro	Ile	Cys	Asn	Leu	Arg	Leu	Met	Lys	Leu	Ala	Arg	Glu	Ser	
	290					295					300					
Arg	Pro	Leu	Val	Pro	Gln	Phe	Pro	His	Phe	Glu	Asn	His	Ile	Lys	Thr	
305					310					315					320	
Ser	Val	Asp	Glu	Gly	Ala	Lys	Ile	Asp	Arg	Gly	Ile	Arg	Phe	Leu	His	
				325					330					335		
Asp	Gln	Ile	Met	Ser	Val	Lys	Thr	Val	Asp	Leu	Thr	Leu	Val	Ile	Tyr	
			340					345					350			
Gly	Ser	Phe	Arg	His	Trp	Gly	His	Pro	Phe	Ile	Asp	Tyr	Tyr	Ala	Gly	
		355					360					365				
Leu	Glu	Lys	Leu	His	Ser	Gln	Val	Thr	Met	Lys	Lys	Asp	Ile	Asp	Val	
	370					375					380					
Ser	Tyr	Ala	Lys	Ala	Leu	Ala	Ser	Asp	Leu	Ala	Arg	Ile	Val	Leu	Phe	
385					390					395					400	
Gln	Gln	Phe	Asn	Asp	His	Lys	Lys	Trp	Phe	Val	Asn	Gly	Asp	Leu	Leu	
				405					410					415		
Pro	His	Asp	His	Pro	Phe	Lys	Ser	His	Val	Lys	Glu	Asn	Thr	Trp	Pro	
			420					425					430			
Thr	Ala	Ala	Gln	Val	Gln	Asp	Phe	Gly	Asp	Lys	Trp	His	Glu	Leu	Pro	
		435					440					445				
Leu	Ile	Lys	Cys	Phe	Glu	Ile	Pro	Asp	Leu	Leu	Asp	Pro	Ser	Ile	Ile	
	450					455					460					
Tyr	Ser	Asp	Lys	Ser	His	Ser	Met	Asn	Arg	Ser	Glu	Val	Leu	Lys	His	
465					470				475						480	
Val	Arg	Met	Asn	Pro	Asn	Thr	Pro	Ile	Pro	Ser	Lys	Lys	Val	Leu	Gln	
				485					490					495		
Thr	Met	Leu	Asp	Thr	Lys	Ala	Thr	Asn	Trp	Lys	Glu	Phe	Leu	Lys	Glu	
			500					505					510			
Ile	Asp	Glu	Lys	Gly	Leu	Asp	Asp	Asp	Asp	Leu	Ile	Ile	Gly	Leu	Lys	
		515					520					525				

Gly	Lys	Glu	Arg	Glu	Leu	Lys	Leu	Ala	Gly	Arg	Phe	Phe	Ser	Leu	Met
530						535					540				
Ser	Trp	Lys	Leu	Arg	Glu	Tyr	Phe	Val	Ile	Thr	Glu	Tyr	Leu	Ile	Lys
545					550					555					560
Thr	His	Phe	Val	Pro	Met	Phe	Lys	Gly	Leu	Thr	Met	Ala	Asp	Asp	Leu
				565					570					575	
Thr	Ala	Val	Ile	Lys	Lys	Met	Leu	Asp	Ser	Ser	Ser	Gly	Gln	Gly	Leu
			580					585					590		
Lys	Ser	Tyr	Glu	Ala	Ile	Cys	Ile	Ala	Asn	His	Ile	Asp	Tyr	Glu	Lys
		595					600					605			
Trp	Asn	Asn	His	Gln	Arg	Lys	Leu	Ser	Asn	Gly	Pro	Val	Phe	Arg	Val
	610					615					620				
Met	Gly	Gln	Phe	Leu	Gly	Tyr	Pro	Ser	Leu	Ile	Glu	Arg	Thr	His	Glu
625					630					635					640
Phe	Phe	Glu	Lys	Ser	Leu	Ile	Tyr	Tyr	Asn	Gly	Arg	Pro	Asp	Leu	Met
				645					650					655	
Arg	Val	His	Asn	Asn	Thr	Leu	Ile	Asn	Ser	Thr	Ser	Gln	Arg	Val	Cys
			660					665					670		
Trp	Gln	Gly	Gln	Glu	Gly	Gly	Leu	Glu	Gly	Leu	Arg	Gln	Lys	Gly	Trp
		675					680					685			
Ser	Ile	Leu	Asn	Leu	Leu	Val	Ile	Gln	Arg	Glu	Ala	Lys	Ile	Arg	Asn
	690					695					700				
Thr	Ala	Val	Lys	Val	Leu	Ala	Gln	Gly	Asp	Asn	Gln	Val	Ile	Cys	Thr
705					710					715					720
Gln	Tyr	Lys	Thr	Lys	Lys	Ser	Arg	Asn	Val	Val	Glu	Leu	Gln	Gly	Ala
				725					730					735	
Leu	Asn	Gln	Met	Val	Ser	Asn	Asn	Glu	Lys	Ile	Met	Thr	Ala	Ile	Lys
			740					745					750		
Ile	Gly	Thr	Gly	Lys	Leu	Gly	Leu	Leu	Ile	Asn	Asp	Asp	Glu	Thr	Met
		755					760					765			
Gln	Ser	Ala	Asp	Tyr	Leu	Asn	Tyr	Gly	Lys	Ile	Pro	Ile	Phe	Arg	Gly
		770				775					780				
Val	Ile	Arg	Gly	Leu	Glu	Thr	Lys	Arg	Trp	Ser	Arg	Val	Thr	Cys	Val
785					790					795					800
Thr	Asn	Asp	Gln	Ile	Pro	Thr	Cys	Ala	Asn	Ile	Met	Ser	Ser	Val	Ser
				805					810					815	
Thr	Asn	Ala	Leu	Thr	Val	Ala	His	Phe	Ala	Glu	Asn	Pro	Ile	Asn	Ala
			820					825					830		

Met Ile Gln Tyr Asn Tyr Phe Gly Thr Phe Ala Arg Leu Leu Leu Met
 835 840 845

Met His Asp Pro Ala Leu Arg Gln Ser Leu Tyr Glu Val Gln Asp Lys
 850 855 860

Ile Pro Gly Leu His Ser Ser Thr Phe Lys Tyr Ala Met Leu Tyr Leu
 865 870 875 880

Asp Pro Ser Ile Gly Gly Val Ser Gly Met Ser Leu Ser Arg Phe Leu
 885 890 895

Ile Arg Ala Phe Pro Asp Pro Val Thr Glu Ser Leu Ser Phe Trp Arg
 900 905 910

Phe Ile His Val His Ala Arg Ser Glu His Leu Lys Glu Met Ser Ala
 915 920 925

Val Phe Gly Asn Pro Glu Ile Ala Lys Phe Arg Ile Thr His Ile Asp
 930 935 940

Lys Leu Val Glu Asp Pro Thr Ser Leu Asn Ile Ala Met Gly Met Ser
 945 950 955 960

Pro Ala Asn Leu Leu Lys Thr Glu Val Lys Lys Cys Leu Ile Glu Ser
 965 970 975

Arg Gln Thr Ile Arg Asn Gln Val Ile Lys Asp Ala Thr Ile Tyr Leu
 980 985 990

Tyr His Glu Glu Asp Arg Leu Arg Ser Phe Leu Trp Ser Ile Asn Pro
 995 1000 1005

Leu Phe Pro Arg Phe Leu Ser Glu Phe Lys Ser Gly Thr Phe Leu Gly
 1010 1015 1020

Val Ala Asp Gly Leu Ile Ser Leu Phe Gln Asn Ser Arg Thr Ile Arg
 1025 1030 1035 1040

Asn Ser Phe Lys Lys Lys Tyr His Arg Glu Leu Asp Asp Leu Ile Val
 1045 1050 1055

Arg Ser Glu Val Ser Ser Leu Thr His Leu Gly Lys Leu His Leu Arg
 1060 1065 1070

Arg Gly Ser Cys Lys Met Trp Thr Cys Ser Ala Thr His Ala Asp Thr
 1075 1080 1085

Leu Arg Tyr Lys Ser Trp Gly Arg Thr Val Ile Gly Thr Thr Val Pro
 1090 1095 1100

His Pro Leu Glu Met Leu Gly Pro Gln His Arg Lys Glu Thr Pro Cys
 1105 1110 1115 1120

Ala Pro Cys Asn Thr Ser Gly Phe Asn Tyr Val Ser Val His Cys Pro
 1125 1130 1135

Asp Gly Ile His Asp Val Phe Ser Ser Arg Gly Pro Leu Pro Ala Tyr
 1140 1145 1150
 Leu Gly Ser Lys Thr Ser Glu Ser Thr Ser Ile Leu Gln Pro Trp Glu
 1155 1160 1165
 Arg Glu Ser Lys Val Pro Leu Ile Lys Arg Ala Thr Arg Leu Arg Asp
 1170 1175 1180
 Ala Ile Ser Trp Phe Val Glu Pro Asp Ser Lys Leu Ala Met Thr Ile
 1185 1190 1195 1200
 Leu Ser Asn Ile His Ser Leu Thr Gly Glu Glu Trp Thr Lys Arg Gln
 1205 1210 1215
 His Gly Phe Lys Arg Thr Gly Ser Ala Leu His Arg Phe Ser Thr Ser
 1220 1225 1230
 Arg Met Ser His Gly Gly Phe Ala Ser Gln Ser Thr Ala Ala Leu Thr
 1235 1240 1245
 Arg Leu Met Ala Thr Thr Asp Thr Met Arg Asp Leu Gly Asp Gln Asn
 1250 1255 1260
 Phe Asp Phe Leu Phe Xaa Ala Thr Leu Leu Tyr Ala Xaa Ile Thr Thr
 1265 1270 1275 1280
 Thr Val Ala Arg Asp Gly Trp Ile Thr Ser Cys Thr Asp His Tyr His
 1285 1290 1295
 Ile Ala Cys Lys Ser Cys Leu Arg Pro Ile Glu Glu Ile Thr Leu Asp
 1300 1305 1310
 Ser Ser Met Asp Tyr Thr Pro Pro Asp Val Ser His Val Leu Lys Thr
 1315 1320 1325
 Trp Arg Asn Gly Glu Gly Ser Trp Gly Gln Glu Ile Lys Gln Ile Tyr
 1330 1335 1340
 Pro Leu Glu Gly Asn Trp Lys Asn Leu Ala Pro Ala Glu Gln Ser Tyr
 1345 1350 1355 1360
 Gln Val Gly Arg Cys Ile Gly Phe Leu Tyr Gly Asp Leu Ala Tyr Arg
 1365 1370 1375
 Lys Ser Thr His Ala Glu Asp Ser Ser Leu Phe Pro Leu Ser Ile Gln
 1380 1385 1390
 Gly Arg Ile Arg Gly Arg Gly Phe Leu Lys Gly Leu Leu Asp Gly Leu
 1395 1400 1405
 Met Arg Ala Ser Cys Cys Gln Val Ile His Arg Arg Ser Leu Ala His
 1410 1415 1420
 Leu Lys Arg Pro Ala Asn Ala Val Tyr Gly Gly Leu Ile Tyr Leu Ile
 1425 1430 1435 1440

Asp Lys Leu Ser Val Ser Pro Pro Phe Leu Ser Leu Thr Arg Ser Gly	1445	1450	1455
Pro Ile Arg Asp Glu Leu Glu Thr Ile Pro His Lys Ile Pro Thr Ser	1460	1465	1470
Tyr Pro Thr Ser Asn Arg Asp Met Gly Val Ile Val Arg Asn Tyr Phe	1475	1480	1485
Lys Tyr Gln Cys Arg Leu Ile Glu Lys Gly Lys Tyr Arg Ser His Tyr	1490	1495	1500
Ser Gln Leu Trp Leu Phe Ser Asp Val Leu Ser Ile Asp Phe Ile Gly	1505	1510	1515
Pro Phe Ser Ile Ser Thr Thr Leu Leu Gln Ile Leu Tyr Lys Pro Phe	1525	1530	1535
Leu Ser Gly Lys Asp Lys Asn Glu Leu Arg Glu Leu Ala Asn Leu Ser	1540	1545	1550
Ser Leu Leu Arg Ser Gly Glu Gly Trp Glu Asp Ile His Val Lys Phe	1555	1560	1565
Phe Thr Lys Asp Ile Leu Leu Cys Pro Glu Glu Ile Arg His Ala Cys	1570	1575	1580
Lys Phe Gly Ile Ala Lys Asp Asn Asn Lys Asp Met Ser Tyr Pro Pro	1585	1590	1595
Trp Gly Arg Glu Ser Arg Gly Thr Ile Thr Thr Ile Pro Val Tyr Tyr	1605	1610	1615
Thr Thr Thr Pro Tyr Pro Lys Met Leu Glu Met Pro Pro Arg Ile Gln	1620	1625	1630
Asn Pro Leu Leu Ser Gly Ile Arg Leu Gly Gln Leu Pro Thr Gly Ala	1635	1640	1645
His Tyr Lys Ile Arg Ser Ile Leu His Gly Met Gly Ile His Tyr Arg	1650	1655	1660
Asp Phe Leu Ser Cys Gly Asp Gly Ser Gly Gly Met Thr Ala Ala Leu	1665	1670	1675
Leu Arg Glu Asn Val His Ser Arg Gly Ile Phe Asn Ser Leu Leu Glu	1685	1690	1695
Leu Ser Gly Ser Val Met Arg Gly Ala Ser Pro Glu Pro Pro Ser Ala	1700	1705	1710
Leu Glu Thr Leu Gly Gly Asp Lys Ser Arg Cys Val Asn Gly Glu Thr	1715	1720	1725
Cys Trp Glu Tyr Pro Ser Asp Leu Cys Asp Pro Arg Thr Trp Asp Tyr	1730	1735	1740

Phe	Leu	Arg	Leu	Lys	Ala	Gly	Leu	Gly	Leu	Gln	Ile	Asp	Leu	Ile	Val	1745	1750	1755	1760
Met	Asp	Met	Glu	Val	Arg	Asp	Ser	Ser	Thr	Ser	Leu	Lys	Ile	Glu	Thr	1765	1770	1775	
Asn	Val	Arg	Asn	Tyr	Val	His	Arg	Ile	Leu	Asp	Glu	Gln	Gly	Val	Leu	1780	1785	1790	
Ile	Tyr	Lys	Thr	Tyr	Gly	Thr	Tyr	Ile	Cys	Glu	Ser	Glu	Lys	Asn	Ala	1795	1800	1805	
Val	Thr	Ile	Leu	Gly	Pro	Met	Phe	Lys	Thr	Val	Asp	Leu	Val	Gln	Thr	1810	1815	1820	
Glu	Phe	Ser	Ser	Ser	Gln	Thr	Ser	Glu	Val	Tyr	Met	Val	Cys	Lys	Gly	1825	1830	1835	1840
Leu	Lys	Lys	Leu	Ile	Asp	Glu	Pro	Asn	Pro	Asp	Trp	Ser	Ser	Ile	Asn	1845	1850	1855	
Glu	Ser	Trp	Lys	Asn	Leu	Tyr	Ala	Phe	Gln	Ser	Ser	Glu	Gln	Glu	Phe	1860	1865	1870	
Ala	Arg	Ala	Lys	Lys	Val	Ser	Thr	Tyr	Phe	Thr	Leu	Thr	Gly	Ile	Pro	1875	1880	1885	
Ser	Gln	Phe	Ile	Pro	Asp	Pro	Phe	Val	Asn	Ile	Glu	Thr	Met	Leu	Gln	1890	1895	1900	
Ile	Phe	Gly	Val	Pro	Thr	Gly	Val	Ser	His	Ala	Ala	Ala	Leu	Lys	Ser	1905	1910	1915	1920
Ser	Asp	Arg	Pro	Ala	Asp	Leu	Leu	Thr	Ile	Ser	Leu	Phe	Tyr	Met	Ala	1925	1930	1935	
Ile	Ile	Ser	Tyr	Tyr	Asn	Ile	Asn	His	Ile	Arg	Val	Gly	Pro	Ile	Pro	1940	1945	1950	
Pro	Asn	Pro	Pro	Ser	Asp	Gly	Ile	Ala	Gln	Asn	Val	Gly	Ile	Ala	Ile	1955	1960	1965	
Thr	Gly	Ile	Ser	Phe	Trp	Leu	Ser	Leu	Met	Glu	Lys	Asp	Ile	Pro	Leu	1970	1975	1980	
Tyr	Gln	Gln	Cys	Leu	Ala	Val	Ile	Gln	Gln	Ser	Phe	Pro	Ile	Arg	Trp	1985	1990	1995	2000
Glu	Ala	Val	Ser	Val	Lys	Gly	Gly	Tyr	Lys	Gln	Lys	Trp	Ser	Thr	Arg	2005	2010	2015	
Gly	Asp	Gly	Leu	Pro	Lys	Asp	Thr	Arg	Ile	Ser	Asp	Ser	Leu	Ala	Pro	2020	2025	2030	
Ile	Gly	Asn	Trp	Ile	Arg	Ser	Leu	Glu	Leu	Val	Arg	Asn	Gln	Val	Arg	2035	2040	2045	

Leu Asn Pro Phe Asn Glu Ile Leu Phe Asn Gln Leu Cys Arg Thr Val
2050 2055 2060

Asp Asn His Leu Lys Trp Ser Asn Leu Arg Lys Asn Thr Gly Met Ile
2065 2070 2075 2080

Glu Trp Ile Asn Arg Arg Ile Ser Lys Glu Asp Arg Ser Ile Leu Met
2085 2090 2095

Leu Lys Ser Asp Leu His Glu Glu Asn Ser Trp Arg Asp
2100 2105